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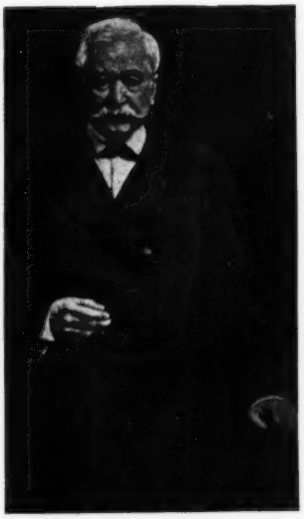
PAPER TRADE JOURNAL

VOL. 122 NO. 21 MAY 23, 1946



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In 1886 . . .

Ferdinand De Lesseps' Panama Canal Company was seeking a loan from the French Government to push their work to completion. The United States eventually bought the uncompleted waterway for $40,000,000 and finished it. Today, the Canal is an important artery linking the world together.

But the strongest link between man and man has been Paper, the basic channel through which information flows. We look backward with pride on a sixty year association with the Pulp and Paper Industry. We look forward with keen anticipation to the years ahead.

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— INCORPORATED —

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Institute Meeting Brings Crowd to Appleton

Crane Wins Contract for Treasury Paper

Newspapers Hold Stocks Well in Hand

Canada Cites Causes of Pulp Shortage

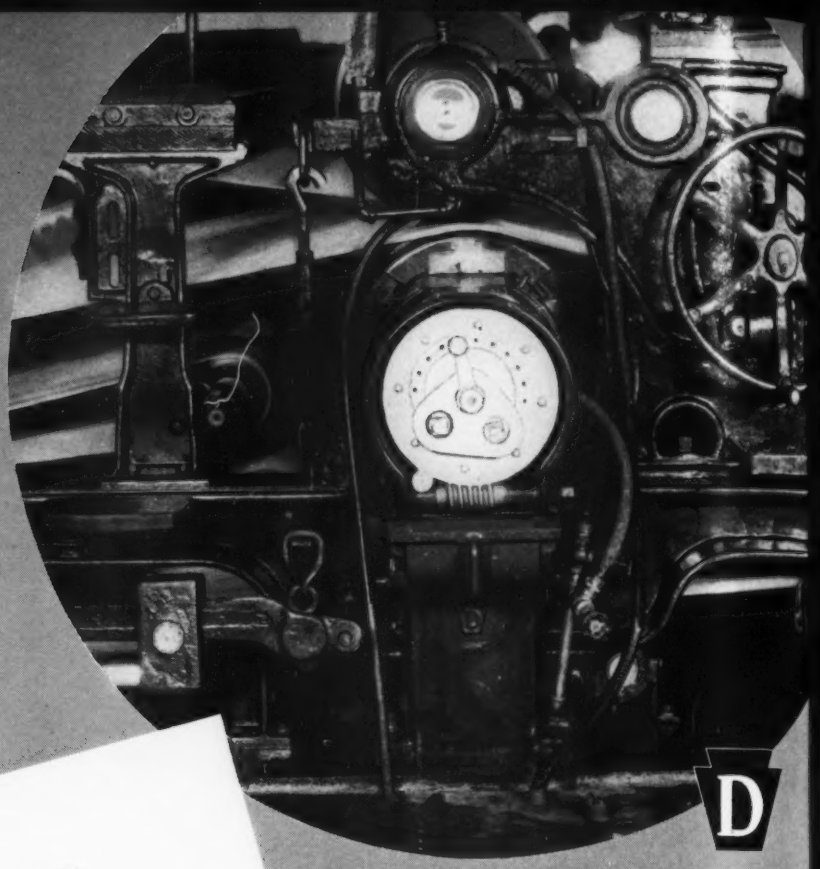
Consolidated Resumes Cutting on Anticosti

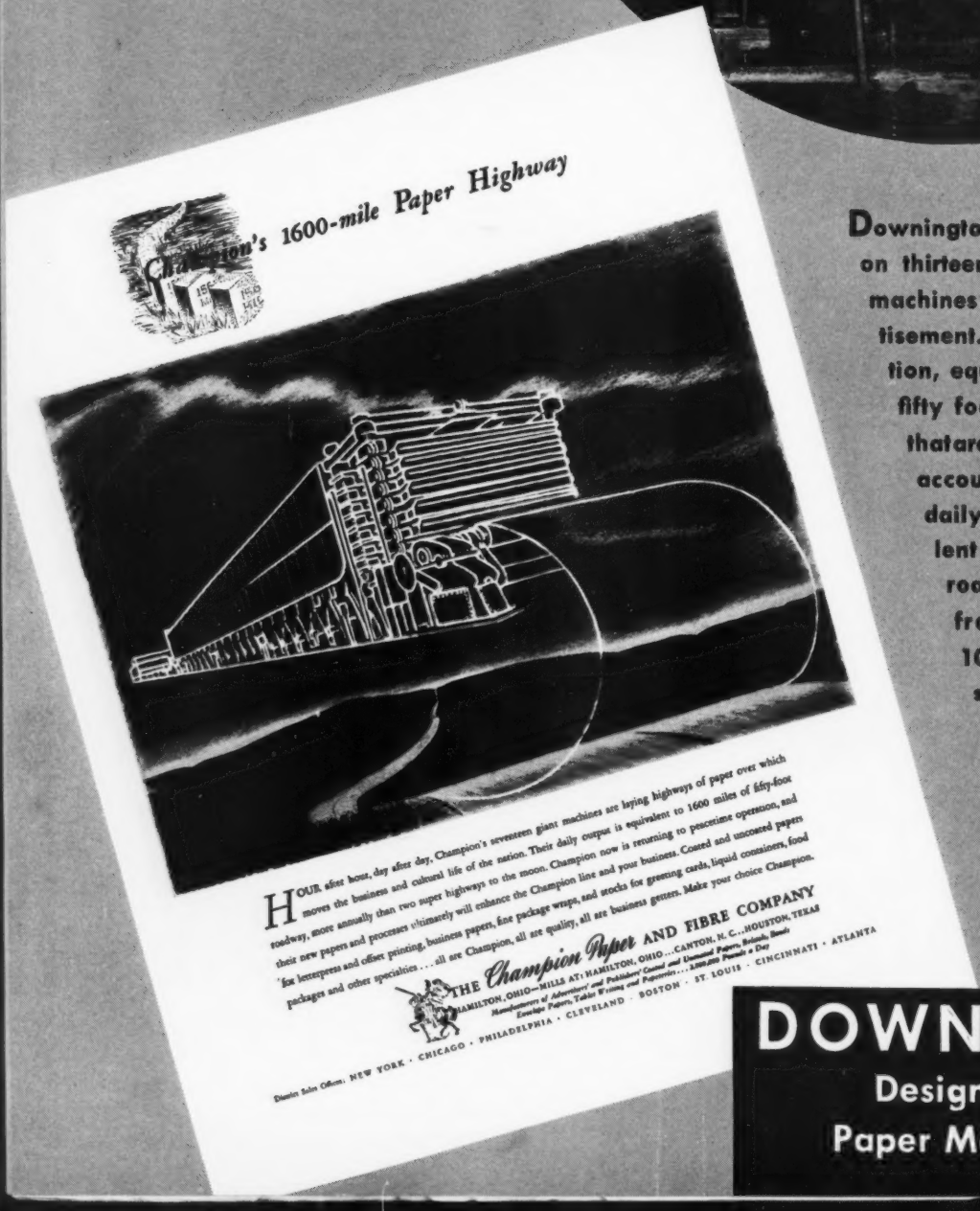
National Container Buys Tomahawk Kraft

Ceilings Are Lifted on All Envelopes

Mahler Is Cited For Contract Work

DID YOU SEE THE Champion Paper Advertisement IN "FORTUNE" MAGAZINE





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HOUR after hour, day after day, Champion's seventeen giant machines are laying highways of paper over which moves the business and cultural life of the nation. Their daily output is equivalent to 1600 miles of fifty-foot roadway, more annually than two super highways to the moon. Champion now is returning to peacetime operation, and their new papers and processes ultimately will enhance the Champion line and your business. Coated and uncoated papers for letterpress and offset printing, business papers, fine package wraps, and stocks for greeting cards, liquid containers, food packages and other specialties . . . all are Champion, all are quality, all are business getters. Make your choice Champion.

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DOWNINGTOWN, PENNA.

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Designers & Builders
Paper Making Machinery

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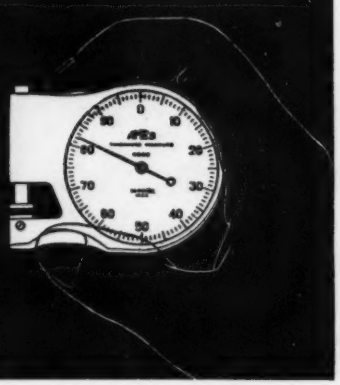
AMES THICKNESS MEASURE No. 25

The neatest, lowest priced, most accurate and durable dial pocket gauge made. Its case is only ¼" thick, dial diameter 1⅝", yet measurements up to 5/16" can be made by thousandths with great accuracy.



B. C. AMES CO., WALTHAM 54 MASSACHUSETTS, U.S.A.

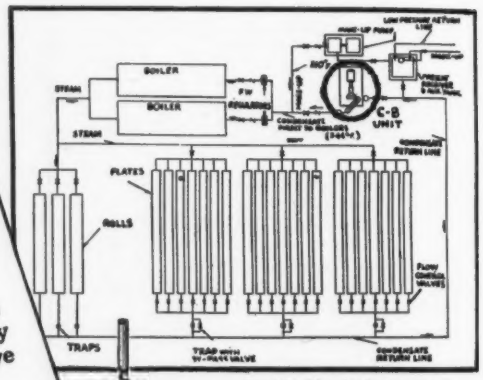
SPEED WAS INCREASED OVER 100 LINEAL FT. PER MINUTE OVER FORMER PRODUCTION

"We have found that the Cochrane Corporation have been conservative in their claims"

CORRUGATED PAPER COMPANY WITH 5 PLANTS COMMENTS ON C-B EQUIPMENT

"We are highly pleased with the results of our Cochrane-Becker installation. Our normal production consists of about 25% double-wall, 35% combinations of .030 liners, and the remaining 40% is 0.16 grades. The speed of both .030 and single-wall, and all grades of double-wall was increased in excess of 100 lineal ft. per minute over our former production. We are also getting a dryer and harder board at the higher speed. Our return line thermometer shows a reading within 10 degrees of our boiler temperatures, and the return is made with no flash loss. We do not have a single trap in our entire system.

We have found that the Cochrane Corporation have been conservative in their claims, and feel you can rely on any statements they make relative to your prospective installation."



TYPICAL HOOK-UP FOR DRAINING A CORRUGATOR

Remarkable results are being obtained by this new method of utilizing or saving the heat units contained in the condensate draining from the process equipment and returning every Btu possible back to the boiler. The C-B System, based on the aspirator or injector principle, has been proved in over 400 installations in the past 7 years.

Write for Publication 3250

COCHRANE CORPORATION
3106 N. 17th St., Phila. 32, Pa.

COCHRANE C-B SYSTEM

CONDENSATE RETURNED TO BOILERS AT HIGH PRESSURE AND HIGH TEMPERATURE

PAPER TRADE JOURNAL
Vol. 122, No. 21 May 23, 1946
Title Reg. U. S. Pat. Off.

Institute's Annual Conference Draws Crowd to Appleton

APPLETON, Wis.—Two hundred executives of paper mills and allied industries from all parts of the United States attended the tenth annual executives' conference of the Institute of Paper Chemistry here Thursday and Friday, May 16 and 17.

Major General William J. (Wild Bill) Donovan, formerly director of the Office of Strategic Services and assistant chief of the United States War Crimes Commission, spoke before the group following a dinner Thursday evening at the North Shore Golf Club, and Brigadier General Georges F. Doriot, head of the Military Planning Division, Quartermaster Corps, spoke at a luncheon Friday noon at North Shore. A symposium on "Trends" was held Thursday afternoon at North Shore and continued at the Institute Friday morning.

The "Trends" symposium was led by John G. Strange, Appleton. Dr. Harry F. Lewis, dean of the Institute, opened the discussion with a talk on "The Educational Dilemma" in which he reviewed the difficulties of education in most institutions of learning but said that the problem is somewhat under control at the Institute. He said that the few staff members who have been lost have been replaced and, while a large number of students are expected in the fall, the Institute feels it can take care of them by new housing units for single men and Quonset huts.

Dr. Lewis spent six weeks on the campuses of seven universities in the South and West recently. He asserted that the dilemma, in a nutshell, is too many GIs and girls, too much demanded by GIs and too few good instructors left to do the job.

He pointed to the shortage of living quarters, inadequate classrooms and laboratories. When the GI bill of rights was passed, he said, it was expected that only about 7% would take advantage of the educational opportunities in it. Present statistics show that close to 31% of the army has plans for further study and the majority are high school graduates. Eight percent are college graduates he said.

Dr. Otto Kress, technical director of the Institute, explained the trends in the expansion of the paper industry and some of the problems relating to the establishment of the new pulp and paper mills in various localities, including Canada, the inland regions of Washington, Montana and Idaho, the West coast and the South. These areas of expansion were discussed on the basis of the availability of wood and other raw materials and transportation.

(Continued on page 38)

DR. OTTO KRESS
Discusses Paper Industry Trends

Crane Wins Contract For Treasury Paper

DALTON, Mass. — Dispatches reaching here from Washington, D. C., reported that Crane and Company is the only bidder to furnish currency and bond paper to the Treasury Department for the coming fiscal year. The bids for the coming year, opened in Washington last week, are higher than prices in the contract now in force with Crane and Company.

For about 1117 tons of distinctive paper on which the government's paper money is printed Crane's bid for 1947 was 41¼ cents per pound. This compares with a present price of 39 cents. The bid for about 364 tons of bond paper on which public debt securities are printed was 32 cents a pound, against an existing rate of 28½ cents a pound.

Newspapers Hold Stocks On Hand

Daily newspapers reporting to the American Newspaper Publishers Association show that stocks of newsprint paper on hand were 30 days supply at the end of April 1946 which is an increase of one day's supply compared with stocks on hand at the end of March 1946. This 30 days supply at the end of April 1946 compares with 43 days at the end of April 1945; 47 days at the end of April 1944; 52 days at the end of April 1943 and 35 days at the end of April 1941. The inventory regulation of the Civilian Production Administration permits a ceiling of 30 days in some states and 50 days in other states.

Daily newspapers reporting to the ANPA consumed 258,984 tons of newsprint paper in April 1946, compared with 203,234 tons in 1945 and 256,431 tons in 1941. This was an increase in April 1946 over April 1945 of 27.4% and an increase over April 1941 of 1.0%. 1941 was the base year for calculating allowable use by newspapers under former WPB Order L-240 until revoked effective Dec. 31, 1945.

The total estimated newsprint consumption in the United States for April 1946 was 364,766 tons which includes all kinds of uses of newsprint paper.

During the first four months of 1946 the reporting newspapers used 970,993 tons of newsprint, an increase of 26.7% over the first four months of 1945 and an increase of 0.7% over the first four months of 1941.

NAM Names Paper Men To Committee Posts

NEENAH, Wis. — Cola G. Parker, president of the Kimberly-Clark Corporation last week was named as a member of two committees of the National Association of Manufacturers, it was announced in New York. The committees are the government finance committee and the research and policy formulation committee.

W. E. Buchanan, Appleton, president and treasurer of the Appleton Wire Works, Inc., was named a member of the government spending committee; A. C. Gilbert, president of the Gilbert Paper Company, Menasha, of the labor-management relations committee; and D. K. Brown, president of the Neenah Paper Company, Neenah, of the inflation economic relations committee.

Canada Cites Causes Of Pulp Shortage

MONTREAL—A special report on the pulp and paper situation, issued by the Export Division of the Department of Trade and Commerce at Ottawa, states that, judging by numerous inquiries constantly being received by the Department, the impression in overseas markets appears to be that pulp and paper commodities are in freer supply than during the war years. "As a matter of fact," says the report, "supplies are still just as tight as, if not tighter than, at any time during the past five years."

Citing as one of the causes of this the early thaw of last spring, which resulted in a considerable quantity of the 1944 cut of pulpwood being left behind in the wood, it says that this will be remedied if during the driving season now in progress this wood, together with the bulk of last season's cut, can be brought out, but even if hopes in this direction fully materialize it will not be until well on in the summer that any relief in the present "tight" supply will begin to be apparent.

Another factor emphasizing what the Department describes as "the urgent need throughout the world for pulp and paper of all kinds," is, according to the report, the increasing demand for pulp as a raw material for the fabrication of rayon, plastics, building and packaging materials and many other products. Also there is the fact that consumption of pulp and paper in the United States "far exceeds that country's production of pulpwood."

As to the outlook for any appreciable relief in the immediate future from sources other than Canada, the Department is skeptical. "Following the reconstruction period," it reports, "Scandinavia will naturally turn to meeting large demands in European countries. There is little likelihood of immediate extensive development in Brazil. Any increase in pulp and paper production in the Soviet Union could easily be absorbed within that country, and exports would be the result of government planning to provide exchange. While the situation in that country is not clear, the total tonnage involved is a very small percentage of world supply."

"Thus," continues the report, "it is apparent that, at least for some time to come, the task of meeting a major portion of the world export demand for pulp and paper must fall to the Canadian industry. In meeting this need, the pulp and paper industry will, as always, contribute in no small measure to the stability of the Canadian economy, particularly in the years that lie immediately ahead."

Incidentally the Department dispels the expectation that the kraft paper situation will soon ease up somewhat, enabling the mills to export additional tonnages. It says that this now appears unlikely, as the heavy demand for kraft paper for the production of multiwall bags for packaging cement, flour, etc., will absorb a larger proportion of Canadian production. In addition, one of the large kraft producers on the Pacific Coast has for two months been running on a reduced schedule owing to water and power conditions.

The report concludes: "While it is expected that in 1947 there will be an even larger quantity of pulp and paper available for export markets than ever before, the situation during 1946 will undoubtedly be tight."

North Carolina Raises Intra-State Freight

RALEIGH, N. C.—The North Carolina Utilities Commission last week issued orders permitting railroads to increase intrastate rates on pulpwood and firewood by five percent. Simultaneously the commission served notice on "representatives of the pulp and paper industry and shippers and carriers of pulpwood" that it is preparing to make an investigation of pulpwood rates to determine whether present rates "are adequate to the present day needs of the industry and the carriers of this commodity."

Informed sources here pointed out that the five-percent increase just granted in intrastate rates on pulpwood and firewood settles a question that has been before the commission since 1938. At that time the Interstate Commerce Commission authorized an increase of ten percent in interstate rail rates, but the State commission authorized only a five percent increase in pulpwood rates.

In July, 1942, as noted, several railroads requested an additional five percent increase on intrastate pulpwood rates. However, upon the request of the railroads hearing on the matter was postponed from time to time until a hearing finally was held on March 27 of this year.

Great Lakes Offers Revision Of Dividend Schedules

TORONTO—An arrangement providing new dividend schedules for Class A and B preferred shares of the Great Lakes Paper Co., will be submitted to special meetings of the three classes of shareholders on June 13. Under the arrangement these shares will receive a fixed cumulative initial preference dividend of $1.20 a year. The class A preferred will receive an additional fixed cumulative dividend of $1.30. After the payment of these preferential dividends the class A preferred and common will share equally in dividends. Arrears on class A and B shares are to be cancelled. If agreed to by 75 percent, of each class of shareholders present at the meeting, the arrangement will be subject to sanction by a judge of the Supreme Court of Ontario.

Midwest Trade Lull Reflected in Paper

CHICAGO—The general slow down of industry through a combination of strikes, price and production problems, had its effect this week on the Chicago paper trade despite continued over-all improvements in pulp production. Locally, business during the week showed improvement, following the strike truce in the coal mining industry but each branch of the industry drew sufficiently heavily on its reserve during the strike period as to be in a most worrisome position at the present time.

Demand continues to run strong in all lines, with merchants hard pressed to make deliveries. However, there are indications that some lightening of OPA restrictions have caused the appearance of a more varied line of products which has helped to get the buyers in a more optimistic frame of mind. All grades of sulphites continued exceedingly strong while book and cover papers were likewise very much in the limelight. Bonds and ledgers were at ceiling peaks and the board market showed only top demand problems. Waste paper interests were handicapped by slowed up collections and the inventories on hand in the mills continue critically low, according to reports.

The Chicago waste paper market, deeply concerned over the prospects of a continuation of the coal strike, is just trying to figure out the damage done by the initial move of John L. Lewis. One of the most critically hurt by the slowup which amounted to a virtual standstill was the waste paper trade. The marker here was featured by a slump in the flow of supplies because of reduced industrial activity. Prices were reported firm at ceilings but some grades came in for slower demand in the East. All supplies in Chicago were absorbed readily. Paper mills generally were reported down to only one week's supply of coal when the "truce" occurred and any resumption of the strike can only have the most critical effect on the industry. The easier undertone continued in waste rags with only light demand noted. Demand for roofing rags was not too active but prices stayed at ceilings. Country mixed rags were reported easily in a highly concerned market.

Ceilings Lifted on All Envelopes

WASHINGTON, D. C.—Price ceilings have been suspended on envelopes at all levels of distribution, including retail, by the Office of Price Administration. Control had been removed previously over stamped and papeterie envelopes, envelopes sold with greeting cards and envelopes printed by commercial printers. This action applies to all other envelopes including those used for ordinary business and personal mail.

Imagine your secretary using bamboo fibre paper and a brush to write your business letters! That belongs to ages long since dead. Modern business calls for advanced methods. For that reason, more and more manufacturers are turning to KELGIN, the algin surface sizing agent—it fits up-to-date requirements—exactly and accurately.

KELGIN is perfectly adapted to the calender box method of application—does not cause picking or foaming—will not stick to the rolls. It is readily soluble in hot or cold water. KELGIN is economical—quickly and easily applied.

KELGIN is a product of Nature—free of impurities and processed under the most rigid specifications to an exact, consistent uniformity. Our Technical Department will gladly cooperate in solving your surface sizing problem—without cost or obligation. Just drop us a line.

KELCO COMPANY

75 E. Wacker Drive, CHICAGO-1 | 31 Nassau Street, NEW YORK-5 | 530 W. Sixth Street, LOS ANGELES-14

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Consolidated Resumes Cutting on Anticosti

MONTREAL—An important additional source of pulpwood in Quebec is being planned as a result of the decision of Consolidated Paper Corporation of Montreal to resume pulpwood cutting operations on Anticosti Island, which were abandoned in 1928 owing to their high cost and the low cost of newsprint then prevailing.

Anticosti is the largest island in the province of Quebec, even larger than Prince Edward Island, which is a province in itself. It possesses over 300 miles of sea coast, and is about 140 miles long, with an average width of 27½ miles. It is covered with a fine stand of spruce and a superior grade of balsam. For many years the island was the sole property of Henri Menier, famous French "Chocolate King," who acquired it at a sheriff's sale in Quebec in 1895. It is situated in the tidal waters of the Lower St. Lawrence, at the point where this river (there about 100 miles wide) debouches into the Gulf of the St. Lawrence.

Mr. Menier early began the exploitation of its forests for pulpwood. He opened an office in New York, and made contracts for the supply of large quantities of pulpwood to American concerns. For years vessels carrying pulpwood from the island to U. S. ports on the Great Lakes were features of shipping on the St. Lawrence waterway. Menier built a railway of some 30 miles into the forest, with an equipment of five locomotives and about 150 cars, to haul pulpwood to the coast. The output reached as high as 50,000 cords per annum.

Between the two World Wars the island came into international prominence because of an attempt by Nazi Germany to get a foothold on it through the guise of a pulpwood cutting contract. By that time the island had become the property of the Consolidated Paper Corporation, with whom a Dutch firm initiated negotiations. When this firm sent a party of Germany engineers to "survey" the island and its harbors, suspicions were aroused, the true nature of the proposed deal unmasked, and the deal declared "off."

It is estimated that the forests of the island now contain 15,000,000 cords of excellent pulpwood, and the company is planning for an annual cut of close to 200,000 cords once operations reach their height, which will not be for some time yet, although cutting will be under way by fall.

A new plan of operations has been devised, which is expected to prove less costly than former operations. It is intended to build roads lengthwise through the center of the island, crossing the various fine salmon streams. The wood will be trucked along such roads down to Ellis Bay, at the extreme point of the island, where there is a fine harbor. Thence it will be transported in ships to the company's mills at Three Rivers and Port Alfred.

Because the Corporation is in full freehold ownership of the island, there will be no stumpage duties to pay the Provincial Government, as when wood is cut on Crown land (which is the case with about three quarters of the wood cut in the province); also there will be no rental of $8 per square mile to be paid the Government, as with leased timber limits. However, the wood cut on Anticosti will be subject to one tax, the new one of 15 cents per cord imposed at the recent session of the Legislature when an educational fund was created. A cut of 200,000 cords a year on Anticosti will mean $30,000 for this fund.

Scott Gets Approval for Half-Million Pier

PHILADELPHIA—Approval for a half-million dollar pier at the Port of Chester has been granted to Scott Paper Company by the Navigation Commission of the Delaware River. The first major improvement to the Port of Chester since the construction of the Ford Motor Company's pier, and the Chester Tidewater Terminal, the Scott project will make it possible for ocean-going vessels to tie up at the foot of Welsh street to unload pulp and to take on paper products.

The Navigation Commission for the Delaware River, which has jurisdiction over pier construction on the Delaware, outside the Port of Philadelphia, approved the Scott application over the joint objection of the Wilson Line, operator of excursion boats, and City of Chester officials.

The Wilson Line, which has its boats stop at Market Street wharf during the summer months, objected on the ground that the construction of a pier by Scott Paper Company would make it difficult to dock at the municipal wharf. The city and the Wilson Line presented a joint argument and brief against the pier construction at hearings held in Philadelphia by the Navigation Commission. The Wilson Line pays the City of Chester a rental of $1,000 per year for the use of the Market Street wharf.

Scott officials said that construction of the pier will be governed by the availability of materials and labor.

Ottawa Measures Effect of Reduction in Fire Losses

OTTAWA—The Lower Ottawa Forest Protective Association reports that in the area it covers, one of the most famous lumbering areas in Canada, a considerable reduction in the extent and cost of forest fires was effected in 1945 by the use of modern equipment such a radio and aircraft. Last year 102 fires were dealt with at a cost of $18,060 and 5,096 acres of forest were burned out. In the previous year 77 fires burned out 100,969 acres, entailing a fire-fighting cost of $36,775.

Pacific Mills Again Logs S. Bentinck Arm

VANCOUVER, B. C. — Pacific Mills Limited has announced the reopening of the logging camp at the head of the South Bentinck Arm, which is roughly 325 miles north of Vancouver.

The company started operations on that site in 1942 and logged about 17 million feet of mainly old-growth fir in 1942-43. A considerable portion of this cut went into military construction projects at Port Edwards. In 1943 the company ceased this operation to concentrate at Queen Charlotte Islands on the production of high-grade aeroplane spruce so vitally needed for the war effort.

The operation at South Bentinck was reopened early in April by the Osborne Lumber and Mercantile Company for Pacific Mills. Reed Banford, Pacific Mills Limited logging superintendent at Ocean Falls, is supervising the contract for the company.

The total operation involves the cutting of approximately 25-30 million feet of spruce, hemlock, cedar and fir. The company estimates an annual cut of 12-15 million feet.

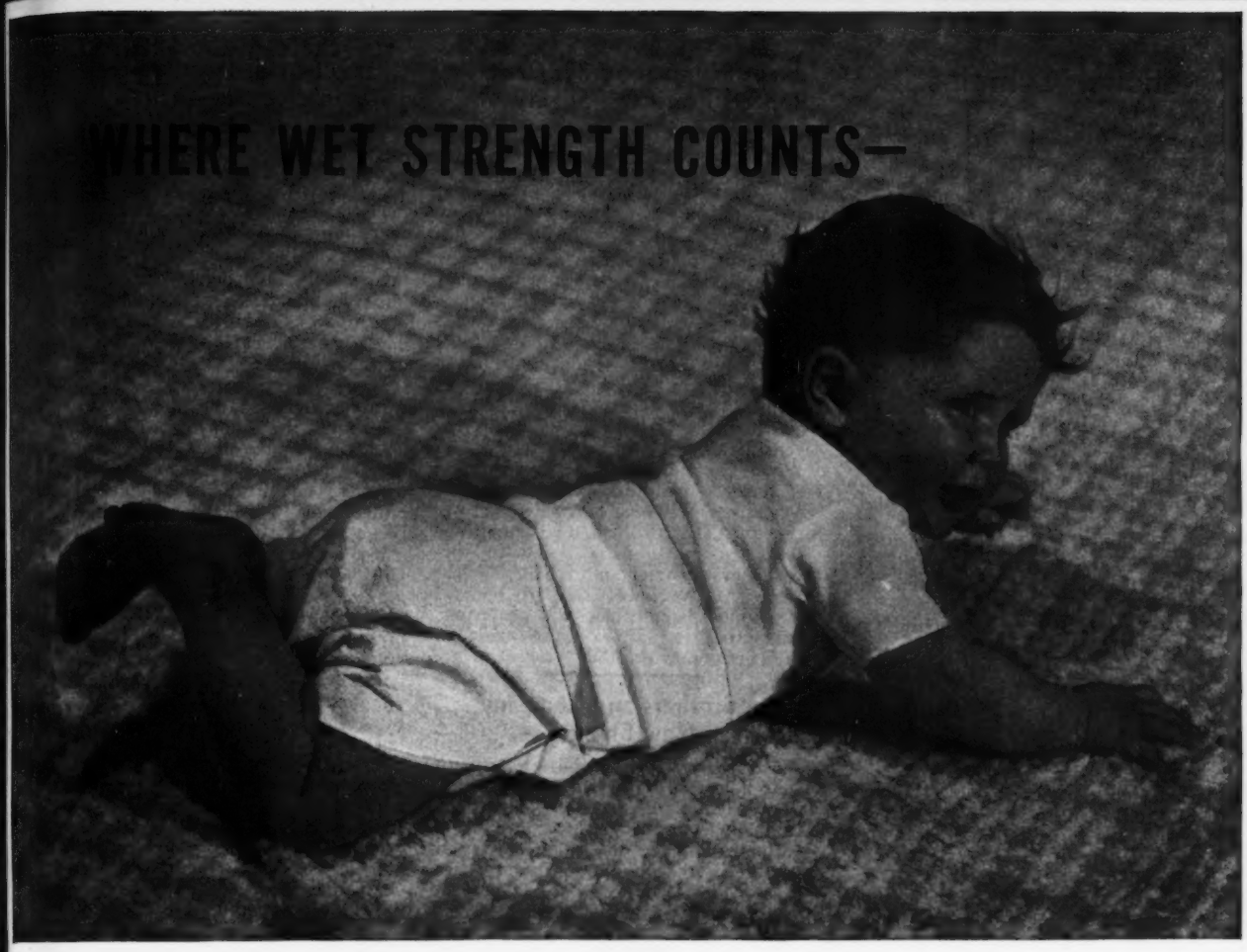
Standard logging equipment, including powerful logging trucks, will be used in the operation. There are 30 men now employed which will be increased to a total of 50 as the operation gets into full production. In line with Pacific Mills forest policy, emphasis will be placed on improved utilization, fire protection and silviculture.

The logs will be flat boomed 70 miles to the sawmill at Ocean Falls where the logs will be utilized for pulp and lumber.

Sapeyes Lay Plans For Assault on Par

The western division of the Salesmens Association of the Paper Industry has announced two golf outings and indicated that a third will be slated for September. The first of the popular events will be held at the Park Ridge Country Club on either July 18 or 25 and the second is slated for Bob-O-Link Golf Club at Highland Park on August 20. James Keeney, Kimberly-Clark Corporation, is chairman of the golf committee and is even now searching assidiously for an assistant chairman. It is reported that all outings will run on the same schedule as those in the past, informal noon luncheon, golf, dinner, prizes and plenty of informal entertainment.

The Association has a special program planned for May 27 at the Hotel Sherman when E. W. Tinker, secretary of the American Pulp and Paper Association will take over the noon luncheon program to discuss "Problems Confronting the Industry and What Is Being Done About Them." An unusually fine attendance is expected for the meeting.



—count on UFORMITES 467 and 470!

There's no question that high wet strength is a *must* in paper diapers. And there's no question, also, that for this and many other applications, the UFORMITES increase wet strength with ease and economy.

Your own paper production can gain many advantages from the use of these urea formaldehyde resins. For, besides increasing wet strength (and as little as 1% resin solids on dry fibre weight will increase wet strength 20% to 30% of the dry strength) the UFORMITES improve dry tensile and Mullen, fold, uniformity of sizing and coating surface characteristics.

UFORMITE 467 is particularly designed for Kraft stocks by beater addition. UFORMITE 470 is recommended for sulfite, rag and ground wood stocks. Neither resin affects the color, odor or taste of paper. Neither requires any special equipment or pre-handling.

You'll find the UFORMITES a low-cost, easy way to *up* paper value. Investigate them today and improve your paper production tomorrow!

UFORMITE *is a trade-mark, Reg. U. S. Pat. Off.*

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

National Container Acquires Tomahawk

WAUSAU, Mis.—Controlling interest in the Tomahawk Kraft Paper Company, Tomahawk, Wis., has been acquired in the open market by National Container Corporation, New York City, Samuel Kipnis, president of the latter concern, announced here Thursday, May 16. Thus a race between National and the Bemis Bro. Bag Company of St. Louis, Mo., for control of the Tomahawk firm apparently ended. It began last February and grew warmer until the closing days of the stock-buying.

National Container approached the Tomahawk firm last February with an offer to buy outstanding stock at $21 a share and a block of the larger stockholders, many of whom live in Wausau, appeared to favor the sale, since Tomahawk stock at that time was quoted at $13 to $14 a share.

Bemis, which has been taking about a quarter of Tomahawk's output, then entered the picture, with an offer of $22 per share on April 18. Subsequently it offered $23 and finally $25. During the bidding National offered $23.50.

Mr. Kipnis said his firm intends to convert the product of the Tomahawk mill to kraft liner board and corrugating material and that as soon as conditions will permit the capacity of the mill will be increased greatly, and that a converting plant for the manufacture of corrugated paper shipping containers will be installed at the mill site.

Rolland Elects Laurendeau

MONTREAL — The Rolland Paper Company Limited, announces it has elected Alderic Laurendeau, K. C., as a member of the board of directors.

Puget Sound at 50 Per Cent Reports Profit Off Slightly

BELLINGHAM, Wash.—Puget Sound Pulp & Timber Company reports a net profit of $94,308, derived from operating the plant at 50 per cent of capacity during the first quarter of 1946, in comparison with $102,201 net for the first quarter of 1945, when the plant was operated at 74 per cent of capacity. After all charges including preferred dividends, these returns were equal to 24 cents a share for the common stock in the 1946 first quarter against 26 cents a share the year before. Pulp production for the first quarter amounted to 15,403 tons this year, against 23,088 tons last year.

Net sales and other revenue totaled $1,207,816 in the first quarter of 1946, compared to $1,593,889 in the like period of 1945. Profit before tax provisions amounted to $151,680 in this year's first quarter and to $227,114 last year. At the lower rate of Federal taxes now applicable, tax provisions amounting to $57,372 were made in the first quarter this year.

Price Brothers and Company To Issue New Stock

MONTREAL — A special meeting of shareholders of Price Brothers & Company, Limited, large newsprint company, was to be held in Quebec City on May 20 to authorize a new preferred stock issue. It was proposed to redeem at par existing 5½ percent $100-par preferred stock and to create a new 4 percent cumulative preferred stock issue of $100 par. Balance of preferred stock outstanding is 56,137 shares. The new preferred issue will amount to 50,000 shares, or a total par value of $5,000,000. The new shares will be redeemable on 30 days' notice at 103 to June 30, 1949, and at 101 thereafter.

Champion Adds Retirement To Employee Benefits

HAMILTON, Ohio—Logan G. Thomson, President of The Champion Paper and Fibre Company, announces the adoption of a Retirement Income Plan for salaried employees of the Company at Hamilton, at Canton, N. C., Houston, Tex., and Sandersville, Ga. Approximately 1100 employees are eligible. The plan became effective on April 28th, 1946, and will be administered by The Equitable Life Assurance Society of the United States.

Any Champion salaried employee who has reached the age of 30, and has served the Company for five years is eligible for the plan. New employees may become members upon completion of these qualifications. The company will be solely responsible for the purchase of past service retirement income, and payment for future service will be shared by company and employee.

The Retirement Income Plan makes provision for retirement of Champion employees at age 65. It is possible, however, with company approval, for an employee to retire at reduced income within a period of ten years earlier, should he so select.

This new plan is part of Champion's employee insurance program. Already employees have been provided Group Life Insurance, Hospitalization and Surgical Benefits. The Retirement Income Plan will further round out the company's insurance program for employees by making provision for a definite income upon retirement of Champion's salaried employees.

Smith Opens in San Francisco

YORK, Pa.—S. Morgan Smith Company has opened a new office at 1 Montgomery Street, San Francisco, 4, Cal., in charge of Ross L. Mahon.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending May 18, 1946

STOCKS

	High	Low	Last
A. P. W.	9¼	8¾	8¾
Armstrong Cork Co.	61¾	60	60
Celotex Corp.	30⅞	29	30¼
Celotex Corp., pf.	21⅜	21	21
Certain-Teed Products Corp.	25¼	24	24¼
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	66¼	61⅞	66
Champion Paper & Fibre Co., pf.	112	112	112
Congoleum Nairn Co.	37½	36¾	37⅜
Container Corp. of America	52¾	50	52
Continental-Diamond Fibre Co.	15	14⅝	14⅝
Crown-Zellerbach Co.	37¼	36⅛	36½
Crown-Zellerbach Co., pf.	108⅞	108¼	108½
Dixie Cup Co.	50⅜	49	50
Dixie Cup Co.—A	60	58	60
Flintkote Co.	45½	43⅜	44⅝
Flintkote Co., pf.	113¾	113	113
Robert Gair	10⅛	9⅝	9⅞
Robert Gair, pf.	20⅝	20⅛	20⅜
International Paper Co.	52⅛	49	49
International Paper Co., pf.	130	122	122
Johns-Manville Corp.	157	154½	154½
Johns-Manville Corp., pf.	142½	142	142
Kimberly-Clark Corp.	66¾	65	66¾
Mac Andrews & Forbes	42	41¾	41¾
Mac Andrews & Forbes, pf.	....	....	....
Masonite Corp.	69	66¼	67
Mead Corp.	28⅞	27	27⅜
Mead Corp., pf. A—6%	106¾	106¼	106¼
Mead Corp., pf. B—5½%	107⅛	105¼	106
National Container Corp.	36½	34¾	36¼
Paraffine Companies, Inc.	84	83½	83½
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	33	29½	30⅞
Rayonier, Inc., pf.	38¼	38	38⅛
Ruberoid Co.	59¾	59	59¾
Scott Paper Co.	55½	54½	55
Scott Paper Co., pf.	108½	108½	108½
Sutherland Paper Co.	52	51½	51½
Union Bag & Paper Corp.	35	33	34⅛
United Paperboard Co.	14⅜	13¾	13¾
U. S. Gypsum Co.	130	128	129½
U. S. Gypsum Co., pf.	204	203½	203½
West Virginia Pulp & Paper Co.	48	47	47½
West Virginia Pulp & Paper Co., pf.	115	115	115

BONDS

	High	Low	Last
Abitibi Pulp & Paper Co. 5s '53	109¾	109¾	109¾
Celotex Corp. 3¾s '55	....	....	....
Certain-Teed Products Corp. 5⅛s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	105	104¾	105
International Paper Co. 5s '47	102	102	102
Mead Corp. 3⅛s '53	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending May 18, 1946

STOCKS

	High	Low	Last
Great Northern Paper Co.	42½	41	41⅜
Hummel-Ross Fibre Corp.	20¾	18¾	20
St. Regis Paper Co.	13¾	12⅞	12⅞
St. Regis Paper Co., pf.	....	....	....
Taggart Corp.	10¾	9⅞	10¼

BONDS

	High	Low	Last
American Writing Paper Co. 6s '61	....	....	....

Mahler Cited For Contract Work

WASHINGTON, D. C.—Ernst Mahler, Executive Vice-president of the Kimberly-Clark Corporation, Neenah, Wis., has been presented the War Department Certificate of Appreciation for his volunteer services with the Readjustment Division, Headquarters, Army Service Forces, in the development of the Pretermination Planning Program, by the War Department. Presentation was made by Brigadier General D. N. Hauseman, Director of the Readjustment Division.

Mr. Mahler pointed out, in 1944, that obtaining informal understandings with War Department contractors was a step toward balanced post war economy. Through his efforts, the recommendation for the Certificate of Appreciation stated, pretermination planning programs were set up with the Aluminum Industry, the Brass Industry, the Rubber Industry, Electrical Manufacturing Industry, Automotive Industry, and other large civilian producers.

Prior negotiations, which included 1570 informal agreements and 1637 formal pretermination agreements were made. These were of invaluable service in facilitating speedier settlements of War Department contracts.

Mr. Mahler's own personal prestige and enthusiasm were prime contributing factors in the cordial reception of the plan by Industry and his intimate knowledge of the needs of Industry went far to make the program a success.

Mr. Mahler also is a member of the Purchase Policy Advisory Committee of the Purchases Division, ASP, having been appointed by General Brehon B. Somervell in 1942. In this capacity he helped to formulate purchase policies, review legislation, and implement the utilization of small war plants, as well as to assist in making contract termination regulations.

From January until April, 1945, he was in the European theater as expert consultant in charge of paper production for the General Purchasing Agent of the Army in the theater. With Headquarters in Paris, he organized production in Belgium, Holland, France and Germany, setting up mills in Belgium with raw materials obtained from Germany.

Shortly after VE day, in May, 1945, he was appointed by the President as industrial adviser to the United States Commission on Reparations in Moscow. He attended the Potsdam conference and was in Berlin for a time, returning to this country at the end of August, 1945.

Eaton to Get Special Cops

PITTSFIELD, Mass., May 12—Mayor Fallen has named seven special policemen at the Eaton Paper Corporation. The appointments are subject to city council confirmation.

FRANK F. FROTHINGHAM
Heads Bird Machine Sales

Crane Starts Enlargement Of Office Building

DALTON, Mass.—Officials of Crane & Company revealed today that extensive alterations will be started within 10 days at the company's main office building on South street. A second floor will be built on the original, or main portion, of the building. The roof will be raised four feet, adding another story to the building, and enlarging the office space by 1600 space feet. E. J. Cramer of Pittsfield has been awarded the contract and J. McArthur Vance is architect. The original building was constructed late in the last century and several additions have been made.

Nekoosa-Edwards Improves Shipping Room Equipment

PORT EDWARDS, Wis.—Nekoosa-Edwards Paper Company has launched a program at its Nekoosa and Port Edwards divisions to facilitate handling of paper in the shipping rooms. Three new trucks have been delivered to the Port Edwards mill and one of the same type is in use at Nekoosa, where two more are expected.

The company has also purchased 100 loading trays. Use of the trucks and trays is expected to speed up loading of cars. A portable elevator for decking large rolls has been acquired, and will help eliminate much heavy lifting.

Purchasing Agents Elect Burns

BOSTON—Kendrick Burns, purchasing agent for the S. D. Warren Paper Company, and manager of the Warren woodlands division, was recently elected vice-president of the New England Purchasing Agents Association, an affiliate of the National Association of Purchasing Agents, at their recent annual meeting in Boston.

Bird Machine Co. Names Frothingham Sales Manager

SOUTH WALPOLE, Mass. — Frank F. Frothingham, for many years manager of the western office of Bird Machine Company, has been appointed sales manager, succeeding F. K. Becker, who was recently elected president of the company. Mr. Frothingham will be responsible for sales and servicing of all Bird pulp and paper machinery. In addition to his duties at Bird Machine Company headquarters in South Walpole, the Western office will remain under his direction.

Mr. Frothingham has been associated with Bird company for twenty years, during which he has become widely known throughout the industry. He has presented a number of papers at TAPPI and Superintendents' meetings.

Before he became a member of the Bird Machine organization he was president of the Boston Belting Company, manager of the Ladies Home Journal Boston office, and general sales manager of the American Felt Company. He brings to his new position as manager of all Bird pulp and paper machinery sales a thorough technical knowledge, broad application experience and keen understanding of every phase of pulp and papermaking in which Bird machinery plays a part.

Container Testing Lab Elects Throckmorton

E. A. Throckmorton, formerly vice-president of Container Corporation of America, has been elected president of Container Testing Laboratories, Inc. He has acquired a substantial interest in the Company.

The Laboratories are engaged in testing, research and consultation services for package users and manufacturers. It is planned to expand substantially the scope of the Laboratories' services in New York, Chicago and San Francisco aided by Mr. Throckmorton's wide background in the packaging industry.

Theodore J. Gross, acting president of the company, will be vice-president in charge of all testing and technical activities at the three laboratories.

Perkins Sponsors Gardens

HOLYOKE, Mass., May 16—B. F. Perkins & Son today revealed a plan to promote Mercy Gardens among its employes and to spur the gardens along the company stands ready to furnish on request a collection of guaranteed vegetable seeds from one of America's largest and most reliable seed houses; a 64-page booklet with complete instructions for the growing and canning of vegetables; and at harvest time the editors of "The Roll Call," the company's new house organ, will inspect the gardens, arrange an exhibit and award prizes for the best specimens of vegetables produced.

P.M. 32 POWDER

Bactericide and Fungicide

ODORLESS-NON-CORROSIVE-SAFE

CONTROLS SLIME

Specifically developed for the pulp and paper industry, "PM 32 Powder" is completely effective in both Acid and Alkaline systems. **Only ½ to 1 ounce** of this powerful disinfectant per ton of stock, dry basis, is usually sufficient to control slime-forming micro-organisms in a pulp or paper system. Eliminates odor-forming Sulphur Bacteria. Maximum Efficiency—Minimum Toxicity.

For complete information write

A. J. LUTH

FALLS CHEMICAL PRODUCTS COMPANY

OCONTO FALLS, WISCONSIN

A NEW FLAT SCREEN by VALLEY

★ 3 years successful operation in a new glassine mill where pulp *must* be clean.

★ Noiseless diaphragm action.

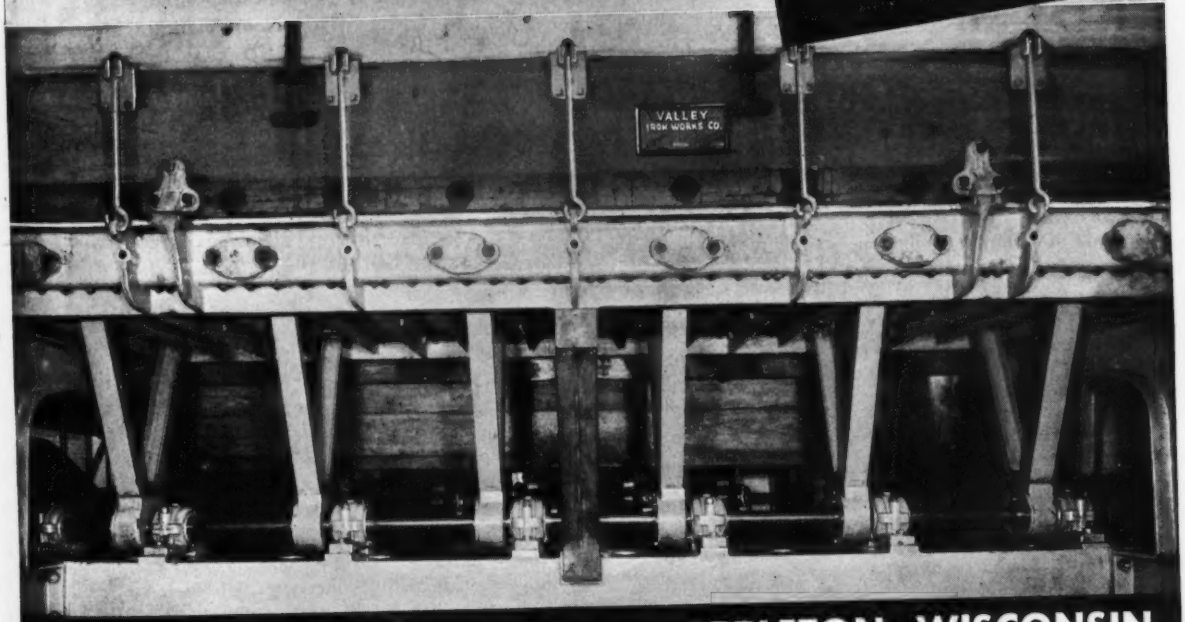
★ Diaphragm throw can be changed in 5 minutes.

★ Maintenance over a 3-year period has been nil.

★ Screens are lubricated twice a year.

★ Note clean lines — modern design.

the Flat Screen for YOUR Mill



VALLEY IRON WORKS CO • APPLETON, WISCONSIN

Stone and Fixner Report on Trees

WAUSAU, Wis.—Norman S. Stone, Mosinee, Wis., vice president and general manager of the Mosinee Paper Mills Company, and Frank Fixner, Spooner, Wis., the company's industrial forest manager, recently discussed the company's forest program at a meeting of the Kiwanis Club in this city.

Recently the company planted 100,000 young trees with its mechanical tree planter on its forest area in Douglas County, and plans to plant a total of 300,000 of these young trees, purchased from the state during its 1946 spring planting program. The forest consists of 62,000 acres in Douglas, Bayfield and Washburn Counties. In addition, 85,000 trees are being planted on the company's property at Mosinee. The trees are mostly jack and Norway pine.

Mr. Stone said that 3,200,000 cords are used annually by paper mills in the Lakes states area. He explained that Wisconsin mills use 1,500,000 cords of pulpwood annually, only 15 percent of which comes from Wisconsin. The Mosinee Mills' annual requirement is about 86,000 cords.

Paper mills, Mr. Stone said, are about 25 years late in the pulpwood production program, adding that one of the reasons for the rapid cutting of forests in the past was excessive tax timber holders were forced to pay on their holdings.

Mr. Fixner said that replanting is made more difficult by the present increased labor cost, but that the company's tree planter will help to reduce the cost by about 50 percent as compared to the old method of tree planting.

Appleton Fetes Three With 35-Year Service

APPLETON, Wis. — Three employees of the Appleton Coated Paper Company with 35 years of service were presented with gold watches at a testimonial dinner and meeting of the company's foremen and superintendents recently at the Island Inn. The watches were presented by Fred C. Heinritz, company president, to Miss Cora Koletzke, Frank Nowak and Elmer Koerner, all of Appleton. A brief talk was given by Major Harold L. Hamilton, an employee of the company before he was called into military service, and now on leave in the United States from Berlin, Germany.

Soundview Income Up by Half

EVERETT, Wash. — Soundview Pulp Company for the four months to April 30 reports net income, $366,691, equal to 66 cents each on 488,250 common shares, compared with $258,451, or 44 cents a share, in the corresponding period of last year.

Junior Achievement Elects Moses, Williamson, Bridgham

SPRINGFIELD, Mass.—Seven Western Massachusetts men, including three from Strathmore Paper company, were elected to the national board of directors of the Junior Achievement at the annual meeting of the corporation held yesterday at the Hotel Sheraton.

Those from the paper industry elected to the national board were: Horace A. Moses, chairman of the board of Strathmore and founder of the country-wide Junior Achievement movement; and George Williamson, president of the Strathmore Paper company; and F. Nelson Bridgham, vice-president and assistant treasurer of Strathmore.

Moses was also chosen as the honorary president of the national corporation of Junior Achievement groups. Although not in good health and confined to a wheelchair, Moses made it a point to attend the national meeting of the group, in which he has had a long and deep interest.

Wisconsin Welcomes Nine Veterans

MILWAUKEE—The high point of the annual stockholders' meeting of the Wisconsin Paper & Products Co. was the expression of welcome to the returned Servicemen. Thus far, nine veterans have returned to the company. They have returned from every theatre — the Philippines, Okinawa, Italy, Germany, Alaska. The Air Force was the most popular branch, but there was also good Naval representation. All employees came through the conflict safely, although one, with the Airborne, is still hospitalized.

At the directors meeting, following the stockholders meeting, the following officers were re-elected: Curtis W. Boyce, president; Fred C. Boyce, vice-president; Harold H. Bergman, secretary; Fred C. Boyce, Jr., treasurer.

Fred C. Boyce is also president of the D. J. Murray Manufacturing Company of Wausau, manufacturers of paper mill machinery, and is a trustee and grand dad of the Paper Mill Superintendents' Association.

Crane Receives Award Of Legion of Merit

DALTON, Mass. — Comdr. Frederick G. Crane, USNR, vice-president of Crane and Company of Dalton, has been awarded the Legion of Merit for exceptionally meritorious conduct as commander of a task unit and group engaged in minesweeping operations in the Yellow Sea. Crane served in the operations from Sept. 1, 1945 to Dec. 4, 1945.

The sweeping of the shallow moored minefield off Tsushima was a particularly dangerous operation, requiring a high degree of leadership and professional skill.

Comdr. Crane recently resumed his position with the paper company.

Green Bay Meeting Hears Timber Facts

GREEN BAY, Wis.—The Northwestern division of the American Pulp and Paper Mill Superintendents Association held a two-day convention here Friday and Saturday, May 17 and 18, with about 300 persons in attendance. About 200 of the group heard a talk Saturday morning by Fred Trenk, extension forester at the University of Wisconsin, Madison. His talk was followed by a movie, "Timber as a Crop." Another speaker was William Thiele, chief engineer of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., who discussed "The Wisconsin River Reservoir Project."

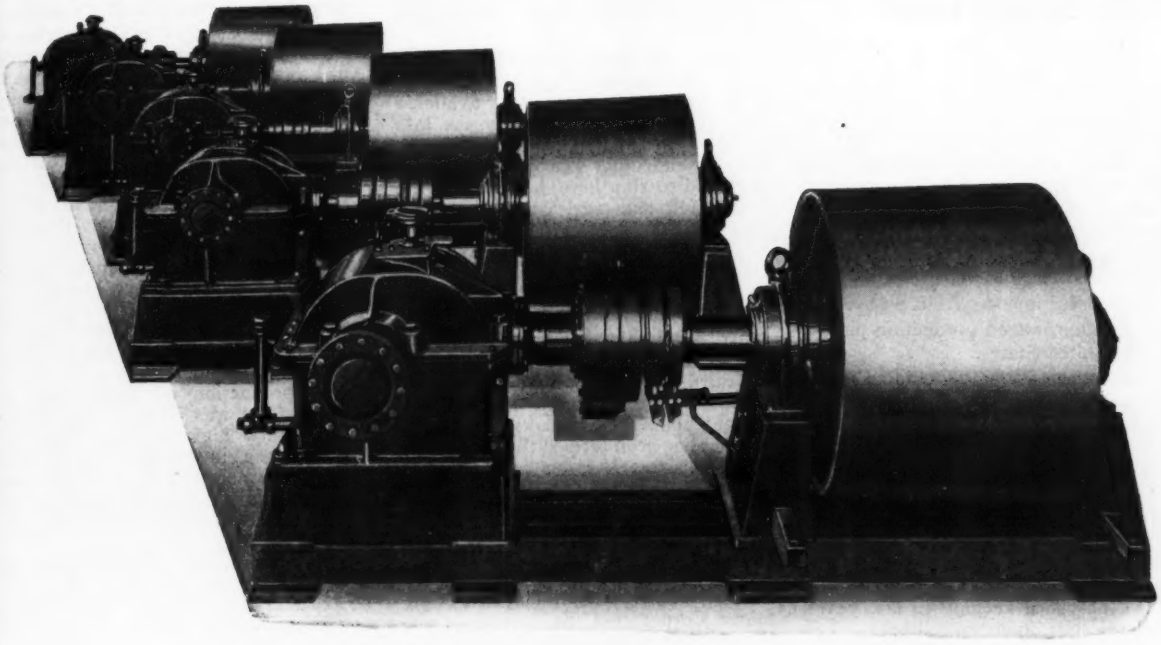
A stag dinner Friday evening which opened the meeting, was held at the Beaumont hotel, as were all of Saturday morning's sessions. The men were entertained at golf and bowling Saturday afternoon, the women at bridge. A dinner dance was given in the evening at Hotel Northland. Representatives on industry from Wisconsin, Michigan and Minnesota attended the conference.

Mr. Trenk in his address stressed pulpwood plantations and woods cropping as essential parts of a program to assure an adequate supply of pulpwood to the Great Lakes states. He said that between 1938 and 1944 there had been a steady rise in percentage of native pine and aspen used in total paper manufacture, with a corresponding reduction in the percentage of balsam and spruce. In the same period Canadian spruce was shown to have increased greatly both in relative percentage and in tonnage in comparison with other sources of spruce.

He advocated increased planting of Norway spruce on idle land in the heavy soil farming areas of the Great Lakes states, and research in methods to increase seedlings of balsam fir; a network of publicly owned demonstration timber harvest forests in farming areas in which the frequent harvesting of new woods growth by the farmers themselves would be suggested as a source of stable income; and legislation, such as the forest regulation bill proposed in the 1945 Wisconsin legislature, designed to outlaw cutting of immature forests.

Production Index Sags

The ratio of United States paper production to mill capacity for the week ending May 11, 1946, as reported by the American Paper and Pulp Association, was 102.8 percent compared with 107.3 percent for the preceding week and 85.4 percent for the corresponding week a year ago. Paperboard production was 97 percent for the current week compared with 101 percent for the preceding week, and 94 percent for the corresponding week a year ago.



Bagley & Sewall NEW ASSEMBLED DRIVES

A Spiral Bevel Gear Unit, Magnetic Clutch and Cone Pulley, as illustrated above, is only one of several different variations of Bagley and Sewall Floor Drives as assembled of standard stock parts. Depending upon speed, ratio and power requirements of each application, the units may be composed by using Hypoid Gears or Worm Gears instead of Spiral Bevel Gears; also, the clutch may be of any type Friction Disc, Magnetic or Airflex. Instead of a cone pulley other types of variable or fixed speed methods may be employed.

BAGLEY B&S SEWALL

THE BAGLEY & SEWALL COMPANY

Builders of Paper Making Machines

WATERTOWN, NEW YORK

Sigel Sees Pulp At 1945 Supply Level

Chemical wood pulp to be made available to paper manufacturers this year will be comparable to the 1945 levels according to present indications, Arthur J. Sigel, vice president of Gottesman & Co., Inc., woodpulp importers, said this week before flying to Nova Scotia to start a survey of the Canadian producing picture. He set forth three reasons for the outlook, as follows:

1—Smaller imports from Sweden.

2—An unchanged production picture in the United States.

3—A decrease in Canadian shipments here.

Lower Swedish shipments, however, will be offset by increased shipments from Finland, expected to reach about 200,000 metric tons. Swedish deliveries will be about 500,000 metric tons for 1946, Mr. Sigel estimated, although that country may be able to raise the figure. United States production he added, has been keeping to last year's levels, despite industry setbacks.

Canadian shipments to this country are expected to show a decline, he explained, because more of the pulp is being used by Canadian paper mills in producing newsprint.

Raising of woodpulp ceilings on April 22 by the Office of Price Administration will result in larger arrivals from abroad, he added, but the action was taken too late to get in maximum tonnage during the second quarter. Advices previous to the April OPA action, Mr. Sigel declared, indicated that the price rises would not be forthcoming, and Swedish mills sold most of their second quarter production to markets outside the United States where they were able to secure higher quotations.

Added to this has been the continued shortage of logs in Sweden caused by a premature spring thaw and scarcity of labor. "These factors," he said, "will materially affect production until the spring of 1947, although it is anticipated that shipments over the second half of 1946 will be larger than for the April-June quarter.

"Best advices so far are that Sweden will ship us during 1946 500,000 metric tons of all grades of chemical wood pulp, although efforts will be made to increase the volume to about 700,000 tons. The latter figure, however, is generally said to be along optimistic lines. Last year sweden shipped the United States about 675,000 short tons." (The metric tons is about 10 percent more than the short ton.)

In the years 1933 to 1939 inclusive the United States received from Sweden between 43 percent and 47 percent of its total imports of all pulps, with the total imports for these years running between 1,950,000 and 2,026,000 short tons. Of this total, Mr. Sigel said, Sweden supplied between 900,000 tons in 1943 and 873,000 tons in 1939, with over a million tons in both 1936 and 1937.

"With the greater consumptive capacity of American paper mills at this time, the smaller quantity available from Sweden, aggravated by the loss of all or part of imports from Finland, Norway and other European countries that used to ship here, has created the keenly felt shortage, which increased tonnage for a time from Canada helped partially to alleviate. An early spring thaw in Sweden also is feared as a serious threat to maximum receipts of pulpwood in Canada."

Mr. Sigel said that a representative of his company who recently completed his third round trip flight to Sweden within a year reported general discontent among the Swedish producers at what has been termed the inadequate price increases.

Gottesman & Co., Inc., are selling agents for many American, Canadian and Swedish woodpulp manufacturers. Included are the International Paper Company, Southern kraft division; the Eastern Corporation, Gaylord Container Corporation, St. Lawrence Paper Mills Company, Ltd., and the Lake St. John Power and Paper Company, Ltd.

Paper Plants Receive Power Rate Reduction

SPRINGFIELD, Mass. — Paper plants throughout Western Massachusetts, with the exception of those in Holyoke, will benefit from rate reductions for industrial users announced by the Western Massachusetts Electric company.

The revision was made in compliance with recent orders from the state Department of Public Utilities, calling for uniform principles to which all fuel charges should conform.

The company said approximately 500 industrial customers have been paying a fuel charge which fluctuates with the price of coal, while conformance with the DPU instructions will result in reduction of costs for these users.

The company has voluntarily added a provision whereby no fuel charges will be made on the first 1000 kilowatt-hours billed industrial customers in anyone month.

Holyoke paper mills are not included in the benefits since they purchase power from the city owned and operated Holyoke Power Company.

Sandborn Joins Crossett Research

CROSSETT, Ark.—L. T. Sandborn has resigned as Research Fellow at Mellon Institute to accept a position in the research laboratory of the Crossett Lumber Company.

Paper and Board Production Continues at Record Pace

WASHINGTON, D. C.—The manufacture of pulp, paper and paperboard continued at a record pace during April as the output of paper and board reached 1,633,000 tons falling only 5,000 tons short of last month's postwar high record, according to preliminary figures by the Bureau of the Census.

Consumption of fibrous materials also continued at a high pace. Receipts of pulpwood at 1,463,000 cords were 253,000 cords below March figure, resulting in a net inventory loss of 70,000 cords. However, waste paper and other fibrous materials were received in sufficient quantities to improve the inventory position.

The production of wood pulp at 897,000 tons was 18,000 tons below last month's high record. Consumption reduced inventories 55,000 tons during the month. This decrease was distributed about evenly between the sulphite and sulphate grades of market pulp.

This preliminary report is estimated to give 100 percent coverage of the industry and is based upon mill returns covering about 80 percent of total operations.

Worthington Force Rejects Holyoke Plant's Offer

HOLYOKE, Mass. — The CIO union workers at the Worthington Pump and Machinery Corp plant here voted unanimously to reject the company's offer for a 10½-cent hourly wage increase. President Leon Massa informed the union membership of the company's offer and immediately called for a vote.

The 10½-cent increase plus the 8 cents an hour addition granted by a temporary settlement some weeks back would put the Holyoke Worthington workers on a wage level with those in the organization's Buffalo, N. Y., and Harrison, N. J., plants. The latter two were on strike for a long time and finally settled for the offer of 18½ cents two weeks ago.

The union rank and file, it was said, that only four cents of it be paid now and the balance in August. The union reiterated a demand for six paid holidays and for vacation pay equivalent to 48 hours for those employed less than five years and 96 hours for those employed over five years. The company had offered 40 and 80 hours.

Connard Joins Riegel Staff

Frank L. Connard, formerly with the Pulp and Paper Division of the War Production Board and more recently a Lieutenant in the United States Navy, has joined the Riegel Paper Corporation. Before serving with the WPB, Mr. Connard was associated with Brown Company and the Mead Corporation. He is at present located at the New York Office of Riegel Paper Corporation.

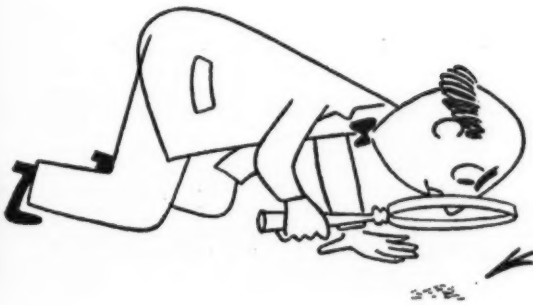
A few p. p. m.

of Calgon*

averts troubles

arising from

water conditions.



Hardness in water forms scale in the water system and on process equipment; it precipitates coloring matter in the washing of pulp; it throws down scale on screens when washing alkaline pulps or de-inked paper stock.

Soft or softened water causes corrosion of iron pipe lines. The corrosion products, taken up by the water, result in iron stains, discoloration of paper and breakdown of bleaching solutions.

Threshold Treatment with Calgon conditions your water supply so that these troubles are eliminated.

Calgon has many other uses in the paper industry, all of which deserve your attention. We'll be glad to send you full information.

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OBITUARY

Dr. Henry V. Dunham

BAINBRIDGE, N. Y. — Dr. Henry V. Dunham, seventy, died at his home on May 11. Until retirement in 1941, he was vice-president of the Casein Company of America and director of The American Plastics Corporation, both companies having plants in Bainbridge. A native of Vermont, Dr. Dunham was the first chemist to be associated with the manufacture and sale of casein in commercial quantities, the first plant locating in Bellows Falls, Vt., in 1898.

Serving for many years as general manager and chief chemist of the Casein Company in Bainbridge, Dr. Dunham became a recognized authority on casein. In this period, he was granted over 40 patents in the casein field, including solvents, defoamers, fillers and thickness for casein glues, methods for making hydrolyzed casein, extruded casein, casein emulsions and casein films. His inventions also included paper coating sizes, plywood glues, seedmeal adhesives and book cloth treatments; also starch, albumin and dried milk adhesives.

In 1923-25, he was instrumental in starting the casein plastics business in this country after investigating methods in Europe. During World War I, he carried out investigations on TNT in England and on the cracking of oil in Russia.

Leopold Miller

HOLYOKE, Mass. — Leopold Miller, 58, longtime employe of the Crocker-McElwain Co. and a member of the International Brotherhood of Papermakers died at Newington, Conn., Veteran's Hospital after a long illness. He was a veteran of World War 1.

John W. Depew

DALTON, Mass. — John W. Depew, 72, retired with six other employes from the Byron Weston company early this month after 29 years of service, died recently at the House of Mercy hospital after a short illness.

John S. Crowe

DALTON, Mass.—John S. Crowe, 63, died while at work in the office of the Byron Weston Co. A veteran employe of the company, he was formerly employed at the American Writing Paper Corp. in Holyoke and was widely known in Western Massachusetts paper circles.

Ahemard Bergeron

HOLYOKE, Mass. — Ahemard Bergeron, 64, an employe of the Crocker-McElwain Co. for many years, died at his home after a short illness. He was a prominent member of the International Brotherhood of Papermakers.

George Pettibone

HOLYOKE, Mass.—George Pettibone, 89, manager of the Westfield Gas and Electric Light company for 50 years, connected with the American Writing Paper corp for many years, and one-time chief engineer of the Valley Paper company died May 11 at his home after a brief illness.

John S. Merriman

HOLYOKE, Mass.—John S. Merriman, Sr., a retired papermaker, who formerly worked for the Chemical Paper Co., died last week in Kalamazoo, Mich., at the age of 81.

Quebec Counts Profit From Small Wood Lots

MONTREAL—The Provincial Government of Quebec has of late years been giving special encouragement to the owners of small wood lots, exploitation of which has been an important auxiliary source of income for farmers for many years past, particularly through the sale of pulpwood. Special facilities have been provided for obtaining expert advice on the use of such wood lots on an annual crop basis, and for obtaining nursery stock for replanting. The result is a steady growth in the value of the output. According to the director of forestry information at the Quebec Department of Lands and Forests, small and intermediate forestry owners of the province last year sold pulpwood, etc., from their wooded areas of a gross value of not less than $81,000,000 during the 12 months.

ROGERS . "NT" . KNIFE . GRINDER

5 SIZES
for knives up to
48" 72" 90" 110" 134"

NEVER A DULL KNIFE
Never a Dull Moment

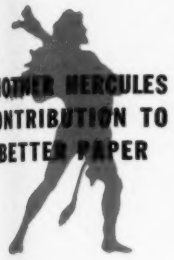
Sturdy Rogers "NT" cabinet base grinders are precision built by the pioneers of the industry for precision grinding. Extra wide "V" ways permit heavier grinding pressure and faster feed. An unskilled operator can easily and safely return knives to action, sharp and true—assuring keen, accurate cutting at low grinding costs. Knives last longer when kept ROGERS SHARP right in your own mill.

Write for Circular "NT"

SAMUEL C. ROGERS & Company
202 Dutton Ave. Buffalo 11, N. Y.

PRECISION QUALITY ROGERS KNIFE GRINDERS SINCE 1887

BOARD



Tests at the Hercules laboratories show a remarkable improvement in strength and rigidity and other properties for paperboard containing Vinsol* Resin.

Hot-pressed at 225-250°F. for 10 minutes at 500 p.s.i., a non-Vinsol board had a flexural strength of 5400 p. s. i. (with machine direction). By adding Vinsol Resin in the beater, this was increased to 16,000 p. s. i. Tensile strength and water-resistance were also increased.

Vinsol may be incorporated into the board by three other methods: molten impregnation; impregnation with a solvent solution; and impregnation with an emulsion of Vinsol.

Recent uses for Vinsol-treated board include: asphalt sheathing, refrigerator board, pattern board, shot hole casing, and construction board. The outstanding properties that make these boards suitable for such tough service indicate their use in many other applications.

Consider the advantages of this economical toughener for *your* paperboards. Mail the coupon today for technical details on Vinsol, or other Hercules chemical materials, listed at right.

*Reg. U. S. Pat. Off. by Hercules Powder Company

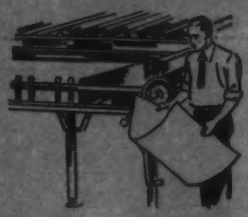
CHEMICAL MATERIALS FOR THE PAPER INDUSTRY

Other Hercules chemical materials for the paper industry include:

Staybelite* Esters...
Wax additives for coating and laminating processes, modifiers for GRS and Neoprene latex for impregnating and laminating paper and board stocks.

Hercolyn*
A liquid resin for transparentizing. Possessing excellent fiber-wetting properties, it is useful for the production of transparent and translucent papers.

Chemical Cotton...
Hercules chemical cotton is a pure cellulose, in loose or sheet form. Cleanliness and brightness are outstanding.



Casein...
Hercules casein is used as the binder in clay-coatings, and as an adhesive in laminants and paper converting.

Paracels*...
Water-dispersible wax emulsions used to increase finish, flexibility, printability, and waterproofing of paper.

Chemicals...
These include sulphonated oils, foam killers, eveners, acids, alkalies, alum, and satin white.

FOR FURTHER DETAILS

Papermakers Chemical Department
HERCULES POWDER COMPANY
INCORPORATED
962 King Street, Wilmington 99, Delaware

Please send information on_____

_____

*Name*_____

*Title*_____

*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

P-63

Washington Sorts Out German Patents

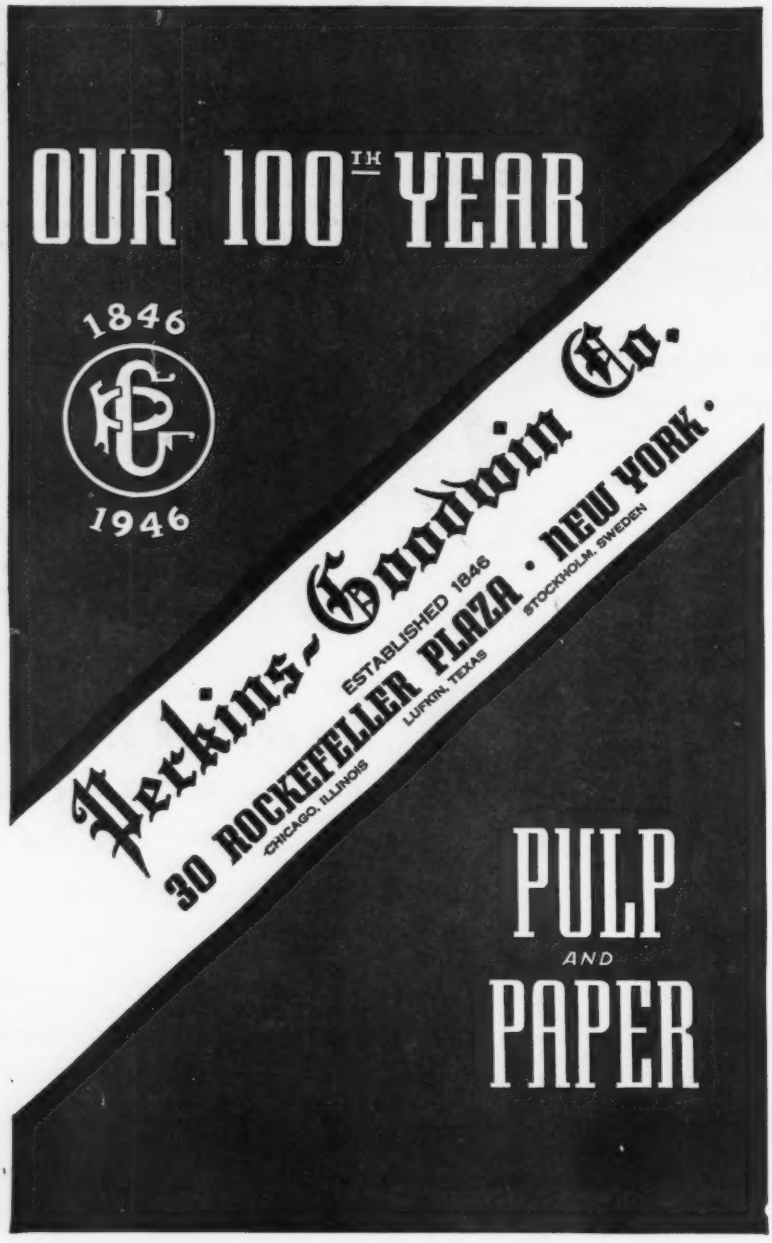
WASHINGTON — Thousands of German patents issued since 1939, of which the United States had no previous knowledge, are now being sorted among ten tons of patent documents seized in the German Patent Office by American forces, through the combined efforts of the U. S. Patent Office and the Office of Publications.

Prior to 1939, patent information was regularly exchanged between Germany and this country. The United States Army, since the war, has seized the documents that fill in the war-year gaps. As a result of the present activity, it is hoped that a number of German patents, of special interest to American business, can be selected from the mass of German records. Those not selected will be returned to the German patent office, as there is no intention, it is stated, to wreck the German Patent Office.

Patents retained by this Government will be made available to American users.

Mexican Mill to Produce Kraft

WASHINGTON — A paper mill under construction at Atenquique, Mexico, is expected to produce about 110 short tons of paper daily, primarily of the brown kraft type, according to a report to the Department of Commerce. The site chosen provides plenty of water and transportation facilities and is accessible to about 600,000 acres of wood in the States of Jelisco and Colima which are reserved for the mill. It is estimated that the plant will consume 70,000 cords of wood a year, operating 24 hours a day.



Permutit Names Two To Executive Posts

H. L. Beohner and A. D. Way have been appointed technical manager and chief mechanical engineer, respectively, of The Permutit Company by H. W. Foulds, president of the water conditioning firm.

In his new capacity, Mr. Beohner will be responsible for the company's technical policy on the application, guarantee and performance of its products which include zeolites, ion exchangers, deaerators, chemical feeds, de-gasifiers and precipitation equipment. He will also serve as chairman of the engineering committee. Mr. Way, as chief mechanical engineer, will administer the engineering department and supervise the mechanical design and layout of equipment.

Westcott Handles Line of Hungerford & Terry, Inc.

LOS ANGELES—The Ralph M. Westcott Company, 1700 South Main Street, has been appointed Southern California Sales Representative by Hungerford & Terry, Inc., of Clayton, New Jersey. The Westcott Company will handle Hungerford & Terry's entire line of water treating equipment including water filtration plants, chemical and Inversand Zeolite water softening plants, condensate de-oiling filters, caustic soda filters, Edwards exchanger de-ionizing machines, coagulators, chemical feed machines and Zeolites.

Baer Opens Howard Paper Store in Atlanta

ATLANTA, Ga.—The Howard Paper Company, a new enterprise for this city, has opened for business at 171 Peters Street, S.W. Howard L. Baer is head of the new firm, which will distribute wrapping and packaging materials, sanitary paper goods and allied lines in Atlanta and vicinity. A warehouse stock will be maintained at the Peters Street address.

Polish Mill Is in Production

WASHINGTON — A paper factory in Jelenia Gora, Poland, which began production in October 1945, had a daily output of 12 short tons of newsprint, printing, satin, and high grade paper by early 1946 and additional machinery was expected to start shortly, according to a report to the Department of Commerce. Working on three shifts, the plant employed 90 Polish workers. As more employees are trained, the number of Polish workers will be increased and the number of German workers reduced.

PIONEERING *in Hydraulics*

SENSING the potentialities of water as a source of power, S. Morgan Smith, our founder, applied his energies to its utilization.

His pioneering effort in the development of one of the early water turbines to be built in the United States ended in success.

Shrewd men adopted the water turbine as a source of power in ever greater numbers. But S. Morgan Smith's pioneering spirit continued—a spirit still manifesting itself in our endless research and experimentation—factors in the future development of POWER!

If It's Hydraulics— Put It Up to Us!

S·MORGAN SMITH COMPANY
YORK · PENNSYLVANIA · U·S·A·

POWER by SMITH

For COMPLETE Hoist "KNOW-HOW"

● Your job of selecting a hoist for materials handling in your plant is important.

It's important because the hoist you select should "pay its way" through efficient, low cost operation. And before any hoist can pay for itself, it has to be the right one for the job.

To simplify your job of selecting the right hoist, we have prepared a new Reading Chain Hoist Catalog. 40 years of successful hoist engineering lie behind its 32 pages of information on hoist applications, construction details and installation methods. This complete hoist "know-how" is yours with the new Reading Chain Hoist Catalog No. 60. Write today for your copy and full details on the Reading Hoist Line.

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CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

Institute's Conference Draws Good Crowd

(Continued from page 11)

Dr. Clarence J. West of the Institute staff told about the effects of the war on scientific publications, discussing the decrease in volume; second, the decrease in the number of scientific articles because fewer scientists are available who are free to write, the lack of paper for printing and the lack of scientific and technical literature from enemy countries where 50% of this type of literature originated before the war; third, the change in the nature of the articles during the war because of controls, conservation, etc.; and fourth, the effect on patents.

Dr. West predicted three future trends: First, that more articles of a scientific nature will appear; second, much of the confidential work done during the war will be published; and third, that America will become the research center of the world.

Dr. Geoffrey Beall of the Institute staff told the group that information can be better utilized by statistical techniques which force it into patterns easily analyzed and interpreted. Through the selection of sampling techniques, statistics can help to predict performance, he stated. Dr. Beall gave concrete illustrations in the field of corrugated boxboard and others.

Other symposium speakers were Dr. T. A. Howells, "Relations between Plastics and Paper"; Dr. Emil Heuser, "Trends in Synthetic Fibers and Film"; Dr. Louis E. Wise, "The Changing Raw Materials Picture"; Dr. Loren V. Forman, "The Physical Plant"; Dr. J. A. Van den Akker, "Automatic Control"; Dr. B. W. Rowland, "Chemical Innovations"; Dr. Irwin A. Pearl, "Utilizing the Useless," and R. C. McKee, "A Proving Ground for Products."

General Donovan pleaded for "an intelligence service that will enable the United States to maintain its rightful place in the family of nations." He said that it is easier for a nation to wage war than to prevent one and that the critical period for the country is right now. Its safety depends on a knowledge of what other nations are doing.

He gave examples of how the service operated in Germany, France, the Balkans, North Africa and other countries to provide vital information to the allied governments and theater commanders.

General Donovan warned against trying to combine intelligence with policing, either at home or abroad. He also opposed a system whereby intelligence reports would be coordinated or evaluated by the army or navy or state department, emphasizing that these departments would be primarily interested in seeking the inferences that would back up their policies. He urged that a separate agency be set up, responsible to congress and financed directly by congress.

He said the most important thing to know about another country's use of the atomic bomb is not how or where it will be used but when. "If the country knows that then it can be prepared to defend itself," he said.

The general complimented the Institute of Paper Chemistry on the help it gave to OSS, explaining that the service it rendered "could not have been given by any other institution in the country."

General Donovan was introduced by Ernst Mahler, president of the Institute board and executive vice president of Kimberly-Clark Corporation, Neenah, Wis.

Brigadier General Doriot declared in his address that the need for industrial research is just as important during peacetime as it was during the war. He expressed the appreciation of the War Department for the help the industry and the Institute gave the Quartermaster Corps during the war.

"Many businesses to which the War Department had to turn for materials at the beginning of the war had carried on no research about their product other than that done by their advertising and sales forces. Your Institute of Paper Chemistry was one organization upon which we could rely for aid and research," he said.

"It is still as important to have research continued during peace as it is during the war. Whatever does not exist at the time the next war begins will be of little use in winning that war. We may never have a chance to deevlop it then."

Most of the research accomplishments during the war have peace-time applications, he said citing DDT and new fabrics as examples.

Not only is research needed in the line of materials and equipment for the army, but also in the fields of physiology and psychology to get an understanding of human problems, he told the paper executives.

General Doriot asked the industry to allow the army to benefit by its research discoveries. "Do not give the War Department just what is asked of you but offer some of the developments acquired by research which may be of use to them and of which they may not have known. It is your army and your war department and the men who head it are outstanding men and should be backed up."

Port of Rochester Unloads Newsprint Shipment

ROCHESTER, N. Y. — Paper from Newfoundland, destined for two Rochester newspapers, was hoisted last week from the hold of the first seagoing ship to dock at the Port of Rochester since pre-war days. The SS Cedarton, a 1731-ton ship brought 700 tons, or 980 rolls of paper from the Bowater Paper Company mills at Corner Brook, N.F. On this trip, the crew also unloaded about 600 tons of newsprint at Oswego.

The material in a valve must suit the service, POWELL *has all kinds!*

100 YEARS in the School of Experience has taught us many valuable lessons. Not the least of these is the importance of using the *right* valve in the *right* place. Not only type and design but *material* as well must be "just what the doctor ordered."

It is poor economy to use iron when steel is definitely indicated. On the other hand, if iron is thoroughly adequate for the job, there's no sense in using a more expensive material.

The POWELL lines of Iron and Steel Valves are so complete that there's a valve of correct type, size, and design for every service in which these valves are applicable. Equally complete lines of Bronze Valves and Valves to resist all known corrosive media are included in the Complete POWELL Line. The latter are made in the widest range of pure metals and special alloys ever used in making valves. POWELL Engineers are always ready to help you select the right valves.

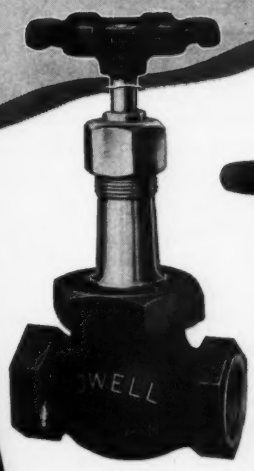

Fig. 190

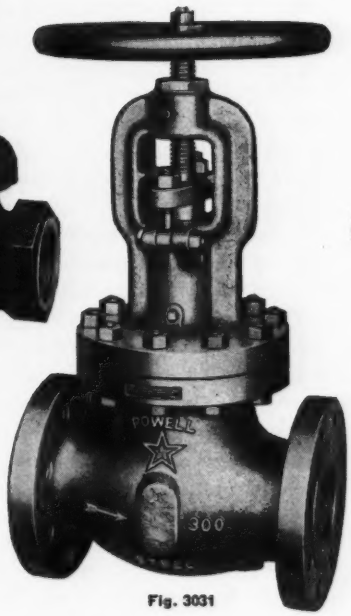

Fig. 3031

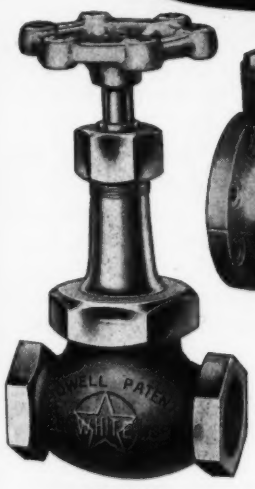

Fig. 1708

Fig. 1561

Catalogs on Request. Kindly specify whether you are interested in Bronze and Iron; Cast Steel; or Corrosion Resistant Valves.

Fig. 241

Fig. 1708—200-pound Bronze Globe Valve with union bonnet, renewable seat and regrindable, renewable, wear-resisting "Powellium" seat and disc.

Fig. 1561—Class 150-pound Cast Steel Swing Check Valve with flanged ends and bolted cap. Disc, when wide open, permits full unobstructed flow through the valve body.

Fig. 241—125-pound Iron Body Bronze Mounted Globe Valve. Has flanged ends, outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. Also available in All Iron for process lines.

Fig. 190—150-pound Iron Body Bronze Mounted "Irenew" Globe Valve. Has screwed ends, union bonnet and regrindable, renewable wear-resisting "Powellium" seat and disc. Also available in All Iron for process lines.

Fig. 3031—Class 300-pound Cast Steel Globe Valve with flanged ends, outside screw rising stem and bolted flanged yoke.

The Wm. Powell Company, Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

W. L. Cook, Editor

When the Public Hesitates

But why, asked the gentleman who was trying to be helpful, do you bother to mix us up with figures about general business, and about retail trade, when we are concerned with the paper business. He had insisted that a recent reference on this page to a severe pause in the retail markets during 1920 and a sharp if temporary drop in volume in 1921 should have been tagged as happening ten years later—when another depression was well along on the way. Because, he said, the records of his own firm showed that they had not noticed any slackening off in orders during the earlier period. His later inquiry followed an explanation that there had, indeed, been a short and uncomfortable lull in trade as a result of what somebody called the "Buyers strike" and that the intended reference was to the effects of that recession in business. "But why should we be interested in retail store conditions?" he asked. Then, in sorrow, he hung up.

That the company which he represents enjoyed its accustomed volume in 1921 is a cause for hearty congratulation. Perhaps, as the bank-trained executive of a large paper mill explained, that firm had not been caught with a large inventory, and was able to keep its affairs in highly liquid condition as the market hesitated before the recovery got under way. His own large company, he recalled, with its substantial inventories in pulp, had not been so fortunate, and had used a lot of red ink at the end of the year.

Actually, a reference to a condition of a quarter century ago that could have been misunderstood might have been expanded. Without reference to dollar values, the record shows that over-all production which had run at about 85 percent of capacity in 1920 fell off to about 57 percent of a slightly larger capacity in 1921. The shrinkage in volume represented a drop of about 29 percent.

That a recession in the general business index and a drop of nearly a third in paper production volume may, after all, have been simply a coincidence. There are those who feel that it is possible that a reduced volume of advertising in the magazines and newspapers, a reduced demand for paper bags in the stores, and the need to liquidate inventories in order to produce cash to pay bills with, also may have had something to do with the lowered volume of the paper mills.

Reconversion Standards

Reconversion, always a major industrial task, and this time rendered even more complicated of planning because of unrest in underlying industries, brings with it also the insistent problem of conversion of standards. That problem is now before the packaging industry which holds in its hands and on its planning boards the future of a considerable portion of the market for pulp and paper products. To a group of this industry in convention assembled recently a packaging expert, S. H. Tompkins of the Crescent Paper Company, Indianapolis, laid out a general policy that contemplates keeping standards high, with only such modfications as may be recognized in particular usages of the industrial buyer. In many instances, the industry is packaging items today which common sense dictates will never be subjected to such rigorous, climatic changes, unknown length of storage, transportation and abuse, as were the products packed and shipped during the War. The conclusion may therefore be drawn that we might be safe in letting down the bars somewhat and modify the specifications. To this the speaker subscribes, but only to a limited degree, and to that degree only, where there are certain known factors or conditions.

Common sense will always come into play, irrespective of who writes the rules and regulations, and today in every-day practice, what with intra-plant shipments, and plant-to-plant shipments, where the time element of end use is known or readily determinable, it would often be sound and advisable to deviate from Government Standards. It is equally obvious that resale merchandise, known to have quick turnover, may not require some of the safeguards mandatorily provided during the War, and so on through the list of many exceptions.

These specifications are all available for study and subsequent acceptance or rejection in whole or in part, with or without modification. Now that the war is over once again products will stand or fall on their own merit, for they are now being shipped under their own name to customers, from whom the industry naturally is seeking repeat business. In many instances a company will be judged by the way its products appear and perform at the time of end use.

Calendar of Coming Events

June 6-8, 1946—Technical Section, Canadian Pulp and Paper Association, Royal Edward Hotel, Port Arthur, Ont.

June 14-15, 1946—TAPPI Empire State Section, Thousand Islands Country Club, Alexandria Bay, N. Y.

June 17-20, 1946—American Pulp and Paper Mill Superintendents Association, Annual Convention, Poland Springs, Me.

June 28-29, 1946—TAPPI Maine-New Hampshire Section, Rangley Lakes House, Rangley Lakes, Maine.

November 4-6, 1946—National Paper Trade Association, Fall Convention, Palmer House, Chicago, Ill.

TAPPI Notes

Percy Sandwell, formerly of the Ontario Paper company, is now chief engineer of the Powell River Company, Ltd., Powell River, B. C.

Norman S. Grant, formerly of the Great Lakes Paper Company, is now technical director of the Spruce Falls Power & Paper Company, Kapuskasing, Ont.

A. C. Clarke will be the official representative of John Bolton & Sons, Inc., Lawrence, Mass., new TAPPI sustaining member.

Erik Stolitander is now assistant director of the Finnish Board Mills Association, Helsinki, Finland.

Charles J. Campbell, formerly of Alvin H. Johnson & Company, Inc., is now staff process engineer for the Kimberly-Clark Corporation, Neenah, Wis.

John A. MacArthur, formerly of Sherbrook Machineries Ltd., is now engineer for the Long Lac Pulp & Paper Company, Ltd., Toronto, Ont.

Robert L. Yoder, recently of the U. S. Army, is now with the Gulf States Paper Corporation, Tuscaloosa, Ala.

Gustaf Ullstrom, formerly of the Orient Paper Mills, Ltd., in India, is now project engineer for Karlstad Mekanisk Werkstad A/B, Karlstad, Sweden.

Lt. Comdr. Carl A. Briggs has returned to Fraser Paper Ltd., Madawaska, Maine as chemist.

The TAPPI Lakes States Section will hold a golf tournament and stag dinner in or near Appleton, Wis., on June 8th.

The TAPPI Maine-New Hampshire Section will meet at the Rangely Lakes House, Rangely Lakes, Maine on June 28-29. John Parsons of Hollingsworth & Whitney Company is in charge of the technical program. There will be unusually fine facilities for golf and fishing.

W. H. Millspaugh, president of Millspaugh, Ltd., Sheffield, England, is now visiting New York City.

K. Maartmann, consulting engineer of Stockholm, Sweden, is visiting in the United States.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1946		Corresponding Weeks—1945	
April 6	104.1	April 7	86.8
April 13	103.6	April 14	87.4
April 20	102.5	April 21	90.7
April 27	100.6	April 28	87.0
May 4	107.3	May 5	90.7
May 11	*102.8*	May 12	85.4

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	90.2	95.9	95.5	91.0	89.7
1946	94.7	98.4	104.4	*102.7*									

COMPARATIVE YEARLY SUMMARIES

	1939	1940	1941	1942	1943	1944	1945	1946
Year to Date	80.2	85.7	91.7	102.2	88.9	88.2	88.3	*100.2*
Year Average	83.4	85.6	97.4	90.4	87.8	88.1	89.7	

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1946		Corresponding Weeks—1945	
April 6	99	April 7	92
April 13	101	April 14	97
April 20	101	April 21	98
April 27	95	April 28	99
May 4	101	May 5	97
May 11	*97*	May 12	94

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1945	91	95	97	97	96	96	86	90	91	97	95	85	93
1946	90	97	100	*99*									

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

P & I ROTABELT

For Use Under Wires or Felts on Paper or Board Machines

•

Used for water removal on either paper or board machines. The Rotabelt is rotated by the wire or felt on paper machine, conforming to same speed. It provides a proved means of increasing wire and felt life. The rotating belt, as illustrated, carries the wire or felt over the suction, thereby transferring friction of wire or felt against the face of box to the underside of the rubber belt and face of the box. The friction of wet rubber on metal is obviously less than the wire or felt on metal. Minimizes wear and tear on wire.

ADVANTAGES

Suction box friction eliminated. Life of machine wire prolonged. Enables maintaining a higher vacuum. More water removed.

PAPER and INDUSTRIAL APPLIANCES
Incorporated
122 East 42nd Street, New York, N. Y.

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You'll never know what you've been missing

Until you try

American Anode latices and mixes

for coating and impregnating paper...

Many paper chemists and engineers haven't had the chance to learn of the remarkable progress made recently in the field of coating and impregnating paper with latices and water mixes. They haven't had a chance to discover that the use of American Anode latices and mixes in a surprisingly large number of cases will result in a *better* product at a *lower* cost.

That's why we hope you will tell us what you are doing and how you are doing it. Give us the opportunity to work with you on standard products as well as new developments. We think that we can help you in a way that you'll like.

You'll like the inherent safety features of water systems, too; no dangerous, explosive solvents; no cumbersome and expensive recovery systems.

Latices and mixes of natural and synthetic rubbers, GEON, HYCAR, neoprene, and Saran are available from our bulk storage. For more information about the *modern* way to coat and impregnate paper, please write Department AD-6, American Anode, Inc., 60 Cherry Street, Akron, Ohio.

The American Anode laboratory in Akron is equipped with the latest and most modern paper testing equipment, and is staffed with people who know how to use it.

AMERICAN ANODE
INCORPORATED

NATURAL AND SYNTHETIC RUBBER LATICES, WATER CEMENTS AND SUSPENSIONS

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
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Easily Hydrating Pulp from Poplar Wood*

By K. W. Fries[1]

Abstract

A definition is given of an easily hydrating pulp, illustrated by results of beating tests of several easily hydrating pulps.

It was found that bleached poplar pulp prepared from mechanically refined chips cooked by the semi-chemical neutral sodium sulphite process as developed by the Forest Products Laboratory is suitable for the production of high density papers such as glassine.

A good grade of glassine was made from 80% bleached poplar and 20% bleached spruce on a commercial paper machine.

An increased demand for special high density papers has created considerable interest lately in the production of easily hydrating pulps as they are required in the furnish of that type of paper.

Previously, easily hydrating pulps were used principally in the manufacture of papers such as glassine, greaseproof, manifold, tracing, and papers for the electrical industry. Recently, however, the demand for impregnation papers for plastics, locker papers, and special packaging applications has enlarged the interest in strong, high density papers and, therefore, in easily hydrating pulps.

It is necessary to use special pulps for these types of papers in order to obtain the desired hydration with the least amount of beating and with the least reduction in tear strength. A pulp is generally understood to be easily hydrating if it fulfills the following requirements:

On beating it should reach a maximum bursting strength in a relatively short time with only a moderate drop in tear values. Both the burst and tear curves should flatten out after a short beating time. Especially the burst curve should not drop too abruptly after it has passed through the maximum. Handsheets made at different intervals of beating time should develop a blister after relatively short beating when they are exposed to an open flame.

The wood cooked at the present time for the production of easily hydrating pulps is spruce and balsam. It is cooked mostly by the indirect sulphite process in either horizontal Mitscherlich, or in vertical digesters at low temperatures and extended cooking time. The acid used is generally high in combined SO_2. There are, however, mills that cook this type of pulp with direct steam under otherwise similar conditions.

There are also some special kraft pulps on the market that can be classified as easily hydrating pulps. Tables I, II, and III give typical beating data of two easily hydrating pulps. One is an indirect sulphite and the other an unbleached kraft pulp. These tables show that the two pulps fulfill the requirements as laid down above for an easily hydrating pulp.

TABLE I.—BLEACHED MITSCHERLICH

Beating Time, minutes	Bursting Strength, %	Tear, %	Hydration
0	52	258	
20	118	113	
40	128	71	Very high
60	135	64	Very high
80	137	60	Very high
100	134	55	Very high

TABLE II.—UNBLEACHED KRAFT

Beating Time, minutes	Bursting Strength, %	Tear, %	Hydration
0	15	396	
20	69	388	
40	110	208	
60	118	159	None
80	125	124	None
100	123	102	High

TABLE III.—SAME KRAFT AS OF TABLE II BUT BLEACHED

Beating Time, minutes	Bursting Strength, %	Tear, %	Hydration
0	39	368	
20	110	250	
40	125	145	
60	133	104	High
80	133	79	Very high
100	127	68	Very high

Pulping Methods

Work with holocellulose has shown that this product develops hydration in remarkably short beating time *(1)*, and attempts were made to employ pulps rich in hemicellulose for the production of high density papers. This interest was greatly furthered during the war when spruce was hard to get and hardwoods grew right in the back yards of most paper mills.

Poplar wood which grows abundantly in the Lake States region is low in lignin content and high in pentosans *(2)*. This species was therefore singled out to find out whether or not a suitable glassine pulp could be made from it.

From past experience it was known that conventional pulping methods such as the strong alkaline and strong acid sulphite cook did not produce easily hydrating pulps from poplar. The hydrolytic action of these processes on cellulosic materials is too drastic so that too much hemicellulose is removed and the resulting pulp does not hydrate as readily as it is desired.

Modifications of commercial cooking methods, even in quite drastic forms, did not yield the expected results. Davis *(3)* tried to cook poplar in dilute caustic soda solutions at reduced pressure. He succeeded in higher yields of bleached pulp and better strength in less beating time. The bleach consumption, how-

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ever, was very high, and the strength was not as high as it should have been.

Commercial cooks of poplar in the authors' mill by the indirect acid sulphite process at 120°C. maximum temperature and a total cooking time of 17 to 18 hours produced pulps that hydrated rather easily but the strength properties were considerably below those of Mitscherlich spruce pulp (see Table IV).

TABLE IV

Beating Time, minutes	Bursting Strength, %	Tear, %	Hydration
0	27	100	
20	57	77	
40	65	62	
60	78	49	
80	79	45	Very low
100	84	41	Very high

This pulp was suitable as a diluent to stretch spruce pulp in the beater furnish, but could not be used as the principle fiber constituent of glassine or greaseproof papers.

It was then tried to apply acid cooking conditions to a semichemical process using calcium base liquor with a total of 3.25% and a combined SO_2 of 1.5%. The cook was held for 8 hours at 110°C. After refining the resulting chips in an attrition mill, a pulp of fair color was obtained at a yield of 87%. Bleaching with sodium chlorite, chlorine, caustic extraction, and hypochlorite produced a pulp of good strength and fair hydration as can be seen from Table V.

TABLE V

Beating Time, minutes	Bursting Strength, %	Tear, %	Hydration
0	55	135	
20	93	131	
40	99	109	
60	124	77	Very low
80	133	68	Very high
100	115	67	Very high

Attention was next directed to the neutral sodium sulphite process as developed by the Forest Products Laboratory at Madison *(4, 5)*. Some aspen pulp that was cooked and bleached at Madison by this process was studied in an experimental stone roll beater with results as shown in Table VI. As can be seen, the pulp developed remarkable strength properties and good hydration.

TABLE VI

Beating Time, minutes	Bursting Strength, %	Tear, %	Hydration
0	99	157	
20	130	126	
40	145	110	
60	147	102	
80	148	84	Very high
100	149	59	Very high

Comparison of the data of Table VI with that of Table I shows that this pulp is well within the strength level of Mitscherlich spruce.

The values of per cent bursting strength and tear were obtained by dividing the burst, Elmendorf tear tests respectively by the basis weight of the test sheet and multiplying by 100. The standard basis weight of the test sheet is 37 pounds (24×36/480). The test sheets trim 10⅝×10⅝ inches and weigh 4.56 grams for a standard basis weight of 37 pounds.

Hydration is estimated by the type and color of blister found when the sheet is heated by an open flame. If a large blister of white color pops up, the hydration is very high. If, however, the blister is only small and partly charred, hydration is low. If the sheet begins to burn without forming a blister, there is no hydration.

Mill Trial

The next step was to prepare about 2 tons of this fiber for a regular mill trial. The cooking and mechanical refining was carried out at the Forest Products Laboratory in Madison along their standard procedure of preparing neutral semichemical sodium sulphite pulp. The bleaching was done in commercial equipment at Rhinelander in two stages following preliminary small-scale trials at the Madison Laboratory. The yield of bleached pulp was 60% based on the original wood.

The resulting stock hydrated easily and ran well on the paper machine. The sheet had good transparency, greaseproofness, and was fully up to the level of a sheet made from indirect spruce with regard to strength properties.

The consumption of chemicals for the preparation of this pulp can be considered approximately as follows:

Na_2SO_3 as Na_2CO_3 per ton of bleached pulp, lb. 525
$NaHCO_3$ per ton of bleached pulp, lb. 180
Cl_2 per ton of bleached pulp, lb. 325
NaOH per ton of bleached pulp, lb. 40

To prepare 525 pounds of Na_2SO_3 requires 440 pounds of soda ash and 135 pounds of sulphur. At $18.00 per ton of soda ash, $16.00 per ton of sulphur, $40.00 per ton of caustic soda, and $30.00 per ton of chlorine, the cost for chemicals per ton is $12.34.

Power consumption for refining, screening, and pumping is about 550 kw.hr. This amounts to $2.75 at a cost of ½ cent per kw.hr.

Figuring the cost of the wood to produce 1 ton of bleached pulp as $20.00, the total cost per ton of bleached pulp is $33.50 exclusive of labor, plant investment, and overhead. If these items are taken as $35.00 per ton, the total cost of bleached pulp would be $70.12 or approximately $70.00. This cost per ton of pulp is not so very much lower than that for bleached spruce, but at a time when spruce becomes scarcer and scarcer, especially at the increased rate of pulp consumption, it may be worth the while to investigate the advisability of producing special pulps from poplar or other hardwoods that are locally available instead of buying spruce that is difficult to obtain and must be hauled a long distance by rail.

Other advantages of pulping hardwoods by the semichemical process are higher yields and better strength properties.

At the present time the semichemical neutral sodium sulphite process as worked out by the Forest Products Laboratory is ready for commercial application. It has been in use for the production of unbleached pulps for many years, and it has been demonstrated that it is feasible to manufacture a bleached pulp of high brightness, good strength, and good hydrating quality.

It should be possible, however, to work out other semichemical pulping processes that use calcium as a base instead of the costly sodium, and by this substitution semichemical hardwood pulps may appear even more attractive than they are now.

Acknowledgment

Acknowledgment is made to Mr. C. G. Schultz, who carried out most of the cooking and bleaching experiments, and to the Pulp and Paper Section of the Forest Products Laboratory where the unbleached semichemical poplar pulp was produced.

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Experience at an English Paperboard Mill Throughout the War*

By Stanley Frederick Smith[1]

Abstract

The experiences of a British paper mill during World War II are related. The plant was manufacturing high grade carton board and coated enamel before the war and it was necessary to convert to packaging items for the war effort.

The mill was designed for the use of wood pulp but with the lack of this material, waste paper and some straw pulp was the basis of most of the operations. Labor also became limited since many of the personnel went into the armed services or were required for Home Guard units.

Bombing although it did not cause extensive damages to the plant property did impose some problems which together with mill maintenance and items required for the armed services taxed the engineering department.

The English company whose war experiences form the subject of this paper greatly appreciates the opportunity to present to American papermakers a picture of its part of the industry over the last few years. An apology for offering to a technical meeting this very small portion of papermaking history is that perhaps, it may sometimes have occurred to American and Canadian papermakers to speculate upon the probable effects of war near at hand upon a typical paper mill.

Accordingly the paper aims at being an account of the happenings at the mill during the changing fortune of the war and includes the many difficulties along with the few stirring events, and also the increasing strain on men and machinery until the final end of the war brought some measure of relief.

The mill is in no way exceptional in having had a worse or better time than similar undertakings in this country; some mills having been so badly damaged by bombing that they have even now not been able to restart, while others were fortunate in not experiencing any bombing at all. Raw materials have been exceedingly short and some mills found their supply so reduced that they either shut altogether or ran only a fraction of their plant.

The experience at this mill was somewhere in between. It was bombed a number of times but was not sufficiently damaged to have to close down, and at the worst, there were just sufficient raw materials to keep going.

A reference should be made here to the work of other British mills in special war-time developments such as the manufacture of fiber jettison petrol tanks for aircraft which played an important part in the course of the war, and also to the mills which turned over to engineering work on a large scale.

Position at Mill Prewar

Turning briefly to the period immediately before the war, this mill presented the picture of a prosperous and rapidly expanding concern. It ran six paperboard machines of the cylinder mold and combined cylinder mold and fourdrinier type, the three newest and largest of which, largely of its own design, were started up in 1931, 1936, and 1938. The mill produced 1,500 tons per week of high grade carton board and some 70% of the output was coated enamel. Great cleanliness of the mill and product were a special feature. Chemical and groundwood pulps were the only fibrous raw materials used and the company had built up large stocks of these and other raw materials.

The social and political outlook at the time was far less bright. The rearming of Germany and the atmosphere of growing tension and threats, the overrunning of Austria, the campaign of distortions and threats against Czecho-Slovakia, then the Munich Agreement followed by the taking over of that nation, and the opening of the same sort of campaign against Poland, left little doubt about the course Germany was following, and the resulting national measures set on foot in Britain had their effect here.

Precautions against air raids were under way and shelters were being constructed including a chamber excavated in a cliff face near the premises. The apparatus and staff to deal with fires were being increased, and practice shut downs of the mill and evacuation of personnel to the shelters were being carried out. The younger men were being called up into the prewar militia, and many of the staff and workpeople were undergoing voluntary part-time training for the Army, Navy, or Air Force.

Outbreak of War

It had been clear that a complete regrouping of the national industrial effort would be necessary in the event of war, and immediately on its outbreak and as a part of the general measures, the British paper industry came under the Paper Control Section of the Ministry of Supply. All stocks of woodpulp were at once acquired by the Control and from that date all orders for paper and paperboard passed through it; the raw materials being allotted at the same time. The very large stocks of woodpulp accumulated by the company became National property, and in fact a considerable proportion was used elsewhere. Call up of the voluntary part-time members of the armed forces and also of reservists took place at once.

War

When the excitement of the declaration of war had subsided an unexpected quiet period followed during which pulp shipments continued to arrive from Scandinavia, the call-up of young men proceeded a little faster, and things went on much as before.

The war suddenly became alive when the Continent was overrun in 1940 and the position began to change rapidly. The Home Guard Civilian Army was formed as soon as the possibility of invasion became apparent and many volunteered from the mill personnel

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and gave up a great deal of their spare time in the next few years to train as soldiers.

Daylight air raids soon began and a German air fleet was seen attacking and damaging the large aircraft works nearby in clear sunny weather. Two days later they tried to repeat the attack and almost the whole staff of the mill saw the raiding force met overhead by a squadron of Hurricane Fighters and put to complete rout. The mood of apprehension that had been building up was changed at once into one of the highest spirits. No more organized daylight raids were seen, although occasional single planes came across, stragglers from the Battle of Britain. Night raids soon followed, a few machines at a time at first, and then the "Blitz" period when several hundred planes formed the raiding force.

During the early phases of raiding, on Government instructions the machines were shut down and the personnel evacuated to the shelters at every warning of enemy planes in the vicinity. So much practice was had at this that in the end everyone except key personnel was inside the shelters within five minutes of the warning, and this without giving away the position of the mill by the boilers blowing off steam.

The warnings soon became so frequent that production was seriously reduced and at a time when the demand for container boards for war packings was increasing rapidly. The system had to be changed and the organization soon settled down to running through all minor raids and warnings, shutting down only when the raid was local and heavy. During warnings, continuous watch was kept from an observation point on the highest roof of the buildings, which was linked by microphone and loudspeakers with all parts of the mill. Through them an account of what was happening outside was broadcast by the observers to the men working in the mill. This worked very well and confidence in the scheme was soon established. It was usually not difficult to tell when a raid was about to start, aircraft circling round and flares falling close being the usual indications, and then it would be time to shut the machines and get the men and women away to the shelters.

During the heavy raiding period there was much hardship through the city which was badly damaged, especially in the center where fires burned out whole blocks of buildings. There was considerable damage in the district surrounding the mill where most of the mill employees live. Many houses were destroyed and many others damaged, often several times, and there was considerable loss of life and injury.

There were many heavy raids and among them one stands out in memory. The "Blitz" was on, the mill shut down and the personnel in the shelters or forming patrol parties. There was some bombing round about and an incendiary bomb fell on a stack of loose wastepaper adjacent to a stack of woodpulp. The waste burnt up rapidly and ignited the woodpulp and the fire was going fiercely by the time the mobile fire pumps were in place on the river bank nearby and delivering water. The stack was close to the mill premises and there was danger of the fire spreading to them for an hour or so until it was gotten under control.

Meantime, the bombing continued and a salvo fell on the dwelling houses nearby. A stream of residents at once began to come away to the mill shelters, injured amongst them, and search parties at once set out from the mill and brought in more people, some badly injured.

In other raids bombs fell into several parts of the mill premises but in many cases failed to explode and only minor damage was done. The manager of the coating department when walking round after a raid was once greeted by the sight of a 200-pound bomb with its tail hidden in the wind-up portion of a coating machine and the nose projecting on to the floor below.

As time progressed, the arrangements to deal with air raids became very well organized and effective, and the mill organization became the unit for the neighborhood under the national plan. It was made up of a number of mobile fire pumps and other appliances, a motor launch on the river equipped with fire pumps and hoses, a patrol and observation system, and a central underground headquarters linked by telephones and runners with the units of the organization, and the city fire service.

Many men were required for fire guard duties and for a long period had to be on duty every night. On account of the shortage of men the need could only be met by the mill personnel working overtime, and rotas of duty were worked out which unavoidably made considerable calls on everyone's time. To add to this, warnings and raids interrupted sleep almost every night; also few did not have extra labors and duties as a result of the raids. Consequently, the recollections that most have of those times are those of great tiredness arising from long periods of activity and lack of sleep.

Here it should be said that the way the men and women stood up to the bombing period was remarkably good and a source almost of wonder for a long time. Old and young they took things as they came and adapted themselves as the situation developed. Boys of seventeen to eighteen seemed to enjoy putting out burning incendiary bombs, and in particular the behavior of wastepaper sorters—most of them elderly mothers and grandmothers — was magnificent during raids at night. In spite of the great hardships suffered by many people there was never anything resembling a loss of spirit.

With the German attack on Russia the night raids became far less serious, whilst at the same time the active measures against them were growing more effective. In 1942 a number of rocket A.A. batteries were sited round the city and these were manned by Home Guard teams. Many from the mill volunteered for this work, only too delighted to have the chance of active retaliation. Some of the mill Home Guards were already serving in the 3.7-inch heavy A.A. batteries in the city.

In 1943-1944 air raids were not a serious matter and the few planes that came over did no harm. Flying bombs and rockets did not reach this area, although had "D" Day been later it is certain that the position should have come under fire from the Cherbourg area where the German preparations were found almost complete.

Labor Supply During the War

There was a temporary shortage at the beginning of the war owing to the call-up of militia and reservists. This mostly concerned the younger and less skilled workers and was made up without difficulty from men displaced from undertakings which were shut down when war commenced. Other factors soon began to operate. As pulp supplies were reduced and replaced by wastepaper, large additional numbers

were required for handling and sorting, and a department grew up for this purpose which at one time employed about 900 men and women on a shift-basis. Then as the call-up proceeded and began to include older men, the number of skilled men left in the machine crews dropped dangerously low, and further dilution by unskilled labor was not possible. A change to two shift working (12-hour shifts instead of 8-hour) was the only solution and was carried out.

Later, the same problem came up again, owing to further call-up, natural wastage, and the high sickness rate that developed after a long period of 12-hour working under war conditions. The shortage was more serious on the second occasion and was only met with difficulty by withdrawing from other departments all who had any experience on making machines, and by training rapidly the few suitable men it was possible to get from other sources. A number of men who had reached retiring age helped the company by staying on.

The general labor position also deteriorated and for some time the mill operated with barely sufficient numbers to keep things going. It became necessary to employ women on shift work in the mill where they have done very good work. Later a number of Italian prisoners of war of the group classed as co-operators became available for laboring duties and eased the position somewhat. With the end of the war and general demobilizaation the position is improving rapidly and it has just been possible to change back to 8-hour shift working.

As the food supply became shorter and working hours longer, the average household found difficulty in keeping its shift workers properly fed, and it was decided to expand the mill canteen services so that every man could be supplied with a hot meal during his day or night's work. This has been a considerable factor in keeping the personnel properly fed and in good heart.

Raw Material Supplies

Woodpulp supplies from Scandinavia ceased when Norway was overrun in 1940. There were considerable stocks of groundwood and chemical pulps at that time at this mill and elsewhere. As these dwindled, limited supplies of Lend-Lease kraft and bleached pulps came in from the United States and Canada and kept the company going for top liner until the end of the war, on the better boards at least, and without these it would not have been possible to have carried on. Groundwood supplies ceased entirely and were replaced by wastepaper.

A certain amount of wastepaper had been collected in this area before the war and the collection was rapidly expanded. Wastepaper collections formed part of the National Salvage Drive, and this company took a considerable part in its organization, particularly in furthering the inclusion of large new collecting areas and population centers in the scheme. At the peak a very large area was supplying the mill and the expenditure of continuous effort resulted in the mill having at the leanest time enough wastepaper to run all machines at a reasonably high production.

Nevertheless, the supply became very short at times, and at one period each weekend saw the premises completely cleared, with the delivery over the weekend as the only fiber to start up with on the Monday morning. During the heavy bombing period several large paper stores were burned out and the partly burnt salvaged reels of paper formed an acceptable, if lamentable, windfall to help keep up operations.

The company was also helped out considerably by using six large digestors to prepare a quick cook straw pulp under a process developed here which gave a very high rate of output, and in this way, up to 300 tons of straw pulp were produced per week. The supply of kraft and bleached pulps decreased to a minimum in 1942 and then increased slowly as the war and shipping took a better turn. Now the war is over there is the welcome experience of seeing deliveries of chemical and groundwood pulps beginning to come in from Scandinavia and Finland.

Separation of the dirt from wastepaper presented a serious problem to this mill which, as has been mentioned, is laid out to use woodpulp. Sorting of wastepaper, conversion of batch breakers to continuous type, and beater and jordan upkeep all became matters of major importance. Gum rosin also became scarce and in company with other British mills it was found possible to replace a fair proportion by petroleum rosin. Coal supplies have been restricted throughout the war and more so as it proceeded, and this has led to the most careful watch on all uses of power and heat to ensure the utmost economy. Most of the fuel supplied is low grade, having a high ash content and calorific value about half that of good coal.

The Mill Product

The prewar product was almost entirely carton board 0.013 to 0.020 inch in thickness, most of the output being coated enamel used in the main for cigarette packings. Container boards formed only a small proportion of the output. The supply of fiber available for carton boards was much reduced as the war proceeded and the boards supplied for this purpose were reduced in thickness, quality and quantity, and at one time were little better than thin chipboard.

On the other hand, container board requirements for war packings increased enormously until most of the output was used for this purpose. Various new types of board were developed for the special requirements of the services. In particular, weather and other conditions in Burma and other theaters of war were found to deteriorate supplies very rapidly and a pitch impregnated board developed here was found to be very successful in resisting penetration by moisture and attack by termites. Large quantities of this board were made for shell containers etc.

Now that pulp is beginning to arrive from Scandinavia the shortage of fiber is not so serious and the mill is experiencing the beginning of the change to a cleaner and higher quality product.

Maintenance of Plant and War-time Conversion and Construction

This side of the work called for as much ingenuity and attention as any since it was necessary, at the same time, to face serious shortages of metals, timber and other materials, and also exceptional requirements for maintenance and conversion. Fortunately, the company had stocked up heavily before war broke out with stores such as beater and refiner bars, timber, iron and steel tubes, etc.

It happened that the most active conversion period came while the plant was being bombed and the changeover of the batch breakers to continuous, and the construction of the large wastepaper sorting plant

were carried out at this time, the latter being built entirely from scrap and secondhand materials.

At the period following Dunkirk the engineering shop had all available men and machine tools turning out parts for the Air Ministry and Admiralty.

The bombing period had its special worries on the maintenance side and also its lighter moments. One bomb landed in the heart of the water filtration plant and did not explode, very fortunately, as it would certainly have shut the mill for a time. The hole in the roof needed attention, but as extra ventilation was needed anyway a cowl over the hole put everything right. Another bomb pitched in the supercalender room, blew the roof off and severely damaged the building, but by some chance it did not as much as scratch the supercalenders. Half of these were running next day and the remainder two days later after the debris had been cleared and a tarpaulin roof put up. We came to notice that the worst raids seemed to occur on Friday nights, often giving us the weekend to get things straight again.

Ventilation was a problem all through the blackout period. The mill had to be blacked out in a hurry at the beginning of the war and provision of sufficient light-tight air passages was not easy. This resulted in very hot humid air in the mill at night which only gave way to better conditions as the problem was slowly mastered.

The introduction of much dirt and grit into the mill along with the wastepaper caused an extraordinary increase in the wear on beater and jordan bars, cylinder mold coverings, fourdrinier wires, etc., and called for a big stepping up of maintenance. Even the problem of keeping drains clear became a sizeable item.

Machine maintenance necessarily dropped back somewhat and it may be some time before the extra wear and tear are fully accounted.

Development Program

The company's active development program was brought almost to a halt when war commenced and the normal process of expansion and replacement of obsolescent plant has been, of necessity, almost entirely suspended, all efforts being applied to overcoming war problems and developing war products. Nevertheless, it has been found possible to continue research and investigation into plant design at intervals during the war with the object of getting our ideas straight for the considerable development which is due to take place. To this end the technical organization has recently been enlarged and regrouped.

The Paper Industry

Longmans, Green & Company have just issued a book by Josephine Perry entitled "The Paper Industry" (128 pp. 6¼ x 8¼). This is one of a series on America at Work which includes books on a number of industries. It is written for the layman who wishes to obtain a general knowledge of the industry.

The chapters cover: A Brief History of Paper and Early Development of the Industry in the United States; Raw Materials; Pulp and Paper Making Processes; Paper Converting, Research and Paper Uses. Although the type is rather large it is not a book written primarily for young readers. It would be of particular value to salesmen, educators, merchants and nontechnical men who wish to obtain a brief but mature outline of the industry. The author obtained her information through interviews and correspondence with many well qualified members of the industry and therefore has avoided the pitfalls of many special writers who have presented rather superficial and inaccurate reports on the subject.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $2.00 per copy.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Solomon Baker, Development Engineer, Rogers Corporation, Manchester, Connecticut, a 1939 graduate of Massachusetts Institute of Technology.

George C. Beatteay, Assistant Sulphite Superintendent, Fraser Companies Ltd., Edmundson, N. B., Canada, a 1933 graduate of Dalhousie University.

John H. Bardsley, Superintendent of Technical Services, St. Lawrence Paper Mills Co., Ltd., Three Rivers, P. Q., Canada, a 1933 graduate of the University of Brtiish Columbia.

Theron T. Collins, Jr., Chemist, Thilmany Pulp & Paper Co., Kaukauna, Wisconsin, a 1939 graduate of Institute of Paper Chemistry.

Norman S. Eppell, Assistant Packaging Engineer, Frozen Food Foundation, Inc., 600 W. Genesee St., Syracuse, New York, a 1942 graduate of the New York State College of Forestry.

S. H. Grimnes, Mechanical Engineer, United States Wallboard Machinery Co., 90 Broad St., New York, New York, a 1922 graduate of the Technical Institute of Technology.

Frederick J. Hoffman, President, Hydraulic Supply Mfg. Co., Seattle, Washington. Attended the University of Washington.

Edward J. Howard, Research Chemist, Canadian International Paper Co., Hawkesbury, Ont., Canada, a 1926 graduate of the University of London.

John F. Inderdohnen, Field Engineer, Chemipulp Process, Inc., Watertown, New York, a 1923 graduate of Penn State College.

Harold W. Knudson, Technical Director, Hollingsworth & Vose Co., East Walpole, Massachusetts, a 1939 graduate of the University of Wisconsin.

Will J. Lessard, Engineer, Chas. T. Main, Inc., 201 Devonshire St., Boston, Massachusetts, a 1937 graduate of the University of Alabama.

Felix A. Mariani, Chemist, Beach & Arthur Paper Mill, Modena, Pennsylvania, a 1937 graduate of Villanova College.

Rae H. Mills, Engineer, J. E. Sirrine & Co., Greenville, South Carolina, a 1936 graduate of the North Carolina State College.

William T. Nelson, Assistant Superintendent, United States Paper Mills, Inc., Chambersburg, Pennsylvania, a 1941 graduate of Dickinson College.

Frank W. Nyborn, Chemist, Bird & Son, Inc., East Walpole, Massachusetts. Attended the Institute of Paper Chemistry.

H. Donald Purdy, Production Manager, The Tuttle Press Co., Appleton, Wisconsin, a 1924 graduate of the University of Michigan.

John M. Richardson, Salesman, Acer, McLernon Ltd., Montreal, P.Q., Canada, a 1939 graduate of McGill University.

The Reaction Between Thio Compounds and Lignin*

By F. E. Brauns[1] and M. A. Buchanan[1]

Abstract

Hydrochloric acid spruce lignin, fully methylated glycol spruce lignin, maple lignin, and beech lignin react with thioglycolic acid with the formation of trithioglycolic acid derivatives. Spruce lignin reacts with butyl and benzyl mercaptans with the formation of tetramercapto lignin condensation products. Hydrochloric acid spruce lignin, when heated with a 10% sodium sulphide solution at 170° C., is completely dissolved with the formation of thiolignin. Some of the lignin derivatives prepared in this work have been methylated with diazomethane.

According to Holmberg *(1)*, lignin in lignified tissues can be rendered soluble by treating the material with a solution of thioglycolic acid in dilute hydrochloric acid on a water bath, followed by extraction with dilute sodium hydroxide solution. As shown by Holmberg and confirmed by Ahlm and Brauns *(2)*, four thioglycolic acid groups enter a lignin building unit of a molecular weight of about 0.40 *(3)*. The mechanism governing this reaction is still in doubt. Because the carboxyl groups of the thioglycolic acid in the lignin condensation product are still free, the thio group must have reacted with the lignin molecule. According to Holmberg *(4)*, thioglycolic acid reacts with lignin by splitting off water between a hydroxyl group of the lignin and a hydrogen atom of the mercapto group of the thioglycolic acid forming a thio ether-like compound. If this is correct, one hydroxyl group of the lignin would disappear for each thioglycolic acid group entering the lignin molecule. On the other hand, Freudenberg *(5)* believes that, in the reaction of alcohols and phenols with lignin, a heterocyclic oxygen ring, such as a furan or pyran ring, is opened with the formation of an ether and simultaneously of a new hydroxyl group. Since mercapto compounds are thio alcohols, they should react with lignin in a way very similar to ordinary alcohols. In order to obtain more information about this reaction, several experiments were carried out using butyl mercaptan, benzyl mercaptan, and thioglycolic acid with various lignin derivatives.

Experimental*

Preparation of Lignin Products

Preparation of thioglycolic acid Willstätter spruce lignin (a). Willstätter spruce lignin (15 grams on moisture-free basis), which had been kept in a moist state, was suspended in a mixture of 250 ml. of 2 *N* hydrochloric acid and 25 ml. of thioglycolic acid and heated on a water bath for 4 hours. After this period the lignin, which had become lighter in color, was filtered and washed with hot distilled water until the filtrate was free of chloride ions. The almost colorless filtrate was discarded. The light yellow-brown thioglycolic acid Willstätter lignin was dried and analyzed. It contained 12.3% MeO and 8.75% sulphur. It was then extracted in a Soxhlet apparatus with ether and petroleum ether and again analyzed: MeO 12.6%, sulphur 8.7%. The yield was almost quantitative. The product is insoluble in dilute sodium hydroxide and organic solvents.

Preparation of the thioglycolic acid condensation product of fully methylated glycol spruce lignin (b). Fully methylated glycol spruce lignin (5 grams, MeO 32.15%) was suspended in a mixture of 75 ml. of methanol, 15 ml. of thioglycolic acid, and 25 ml. of 4 *N* hydrochloric acid and heated on a water bath for 4 hours. The solvents were distilled off under reduced pressure and the residue dried in a vacuum desiccator. It was dissolved in anhydrous dioxane and the solution was centrifuged and filtered. The thioglycolic acid derivative was isolated in almost quantitative yield by dropping the solution into anhydrous ether. After washing with ether and petroleum ether and drying, the product was purified in the same way and analyzed. The methoxyl content was 25.5% and the sulphur content 8.5%.

Preparation of thioglycolic acid beech (c) and maple lignin (d). Extractive-free wood meal (150 grams air dried) was suspended in a mixture of 100 grams of thioglycolic acid and 1 liter of 2 *N* hydrochloric acid and the mixture was heated for 5 hours on a water bath with occasional shaking. The wood meal was filtered, washed thoroughly with distilled water, and air dried; it was then extracted twice with 96% EtOH and again air dried. From the alcohol extract, small amounts of alcohol-soluble products were obtained which were not further investigated. An extraction of the wood meals with dioxane does not remove any lignin. The extracted wood meals were allowed to stand with 1.5% sodium hydroxide solution for 12 hours in a refrigerator, filtered, and the residues washed thoroughly with distilled water. The combined filtrates were acidified with a slight excess of hydrochloric acid and the precipitated thioglycolic acid lignins filtered, washed, and dried. They were purified by solution in dioxane and reprecipitation into ether until a constant methoxyl content was reached. The thioglycolic acid beech lignin was slightly peach-colored and that from maple was cream-colored. Both products were methylated in dioxane solution to a

TABLE I.—YIELDS AND METHOXYL CONTENTS OF THE THIOGLYCOLIC ACID LIGNINS

			Holmberg's Results		
	Beech, %	Maple, %	White Beech, %	Red Beech, %	Maple, %
Yield of alcohol-extracted thioglycolic acid wood	60.5	63.0	53.0	63.0	60.5
Yield of thioglycolic acid lignin	17.5	15.0	16.0	23.0	19.5
MeO in the purified lignin	17.2	17.8	17.4	15.9	17.25
Sulphur in lignin	9.3	9.5	9.8	8.85	9.36
MeO in lignin calculated on the thioglycolic acid-free basis	23.1	24.3	24.2	21.36	23.6
MeO in diazomethane-methylated lignin	27.2	27.4	...	...	...

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* The experiments were carried out by students of the Institute during the lignin course, 1938 and 1940, as follows: (*a*) A. H. Graef; (*b*) G. Kimble; (*c*) F. E. Culp; (*d*) G. H. Sheets; (*e*) K. D. Hay; (*f*) P. B. Hansen; (*g*) J. T. Harrison.

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constant methoxyl content. The analytical data are given in Table I, together with some of Holmberg's results *(1)*.

Preparation of hydrochloric acid lignin from beech and maple (e). These lignins were prepared according to Kalb and Lieser *(12)*. The dark straw-yellow filtrates of the lignins were diluted to 8-10% hydrochloric acid content and heated on a water bath for 4 hours. The black-brown precipitates were filtered, washed free of hydrochloric acid, dried, and analyzed. The analytical data of the lignins and the precipitates are given in Table II.

TABLE II.—HYDROCHLORIC ACID LIGNINS

	Spruce	Beech	Maple
Yield of lignin, %	26.0	22.8	19.25
MeO in lignin, %	15.7	20.8	19.8
MeO in precipitate from filtrate, %	0.45	9.45	16.65

Preparation of butyl mercaptan spruce lignin (f). Spruce wood meal (50 grams air dried), previously extracted with benzene-alcohol, was refluxed for 5 hours with 300 ml. of butyl mercaptan containing 1.5 grams of hydrogen chloride. Without being filtered, the butyl mercaptan was distilled off the dark reddish brown solution, 20 ml. of dioxane were added and again distilled off under reduced pressure. The residue was extracted with dioxane until the dioxane solution was almost colorless and then in a Soxhlet with a mixture of methanol-acetone (1:1). The dioxane solution was concentrated, centrifuged, and dropped into anhydrous ether, causing the butyl mercaptan spruce lignin to separate as a light cream-colored precipitate. It was washed with ether and petroleum ether and dried. For further purification it was redissolved in a mixture of dioxane and methanol (1:1) and the solution dropped into 3 liters of distilled water, vigorously stirred. The light cream-colored product was filtered, washed with water, and dried in a desiccator over sulphuric acid and sodium hydroxide. The product was then again dissolved in dioxane and precipitated with ether. The methanol-acetone extract was worked up in the same way. The pulp, obtained in 53.5% yield, contains 9.7% lignin with a methoxyl content of 12.3%. The purified butyl mercaptan spruce lignin isolated from the dioxane extract had 12.1% methoxyl and 10.1% sulphur, that from the methanol-acetone extract 11% methoxyl.

Preparation of benzyl mercaptan spruce lignin (g). Spruce wood meal (50 grams air dried) was heated for 4 hours on a water bath with 300 ml. of benzyl mercaptan containing 1.5 grams of hydrogen chloride. The excess of mercaptan was distilled off under reduced pressure as far as possible. The residue was then extracted with dioxane and finally in a Soxhlet apparatus with methanol-acetone. The almost white pulp, obtained in 40% yield, contained 1.5% lignin with 5.6% methoxyl and 76.5% alpha-cellulose. The benzyl mercaptan lignin contained 9.2% methoxyl and 9.8% sulphur. It is methylated in anhydrous dioxane with diazomethane to a constant methoxyl value of 12.85%. Its sulphur content is 9.4%.

Action of sodium sulphide upon hydrochloric acid spruce lignin (a). Hydrochloric acid spruce lignin (10 grams) was suspended in 100 ml. of a 10% solution of sodium sulphide and heated in an autoclave for 1 hour at 170°. The lignin was completely dissolved. Acidification of the clear reddish-brown solution caused the separation of a light grayish-brown precipitate. It was filtered, the lignin washed completely free of acid, and dried. The clear colorless filtrate was discarded. It was purified by dissolving it in dioxane and precipitating into anhydrous ether. The yield was almost quantitive. The product was extracted in a Soxhlet apparatus with carbon disulphide and again purified from dioxane and ether as before. It had a methoxyl content of 14.4% and a sulphur content of 3.7%; the properties were similar to those of thio lignin obtained directly from sprucewood.

Discussion

The fact that lignin as it occurs in wood reacts with thioglycolic acid does not mean that isolated lignins, such as hydrochloric acid spruce lignin or lignin derivatives, reacts with thioglycolic acid in the same way. Therefore, it was of interest to examine the behavior of Willstätter spruce lignin towards thioglycolic acid under the conditions used by Holmberg *(4)* and to determine if such a condensation product is soluble in dilute sodium hydroxide solution. When hydrochloric acid spruce lignin is treated with thioglycolic acid in dilute hydrochloric acid, a thioglycolic acid Willstätter spruce lignin with a methoxyl content of 12.5% and a sulphur content of 8.7% is obtained. From the sulphur content it is calculated that three thioglycolic acid molecules have reacted with the lignin building unit. On this basis, a theoretical sulphur content of 8.6% is calculated. The theoretical methoxyl content, on the basis of 14.8% for native spruce lignin, is calculated to be 11.2%, whereas actually 12.5% is found. This higher value is undoubtedly due to the fact that the hydrochloric acid spruce lignin has a higher methoxyl content (15.5 to 16%) than isolated native lignin. Thioglycolic acid Willstätter spruce lignin gives a typical purple lignin color with phloroglucinol-hydrochloric acid as does the thioglycolic acid spruce lignin *(2)* but, unlike the latter, it is still insoluble in dilute sodium hydroxide solution and in organic solvents.

Thioglycolic acid Willstätter spruce lignin differs from the thioglycolic acid spruce lignin obtained by treatment of sprucewood with thioglycolic acid and hydrochloric acid in that the latter contains one more thioglycolic acid group. In thioglycolic acid Willstätter lignin, at least a part of the carboxyl groups of the thioglycolic acid groups are still free, as is indicated by methylation with diazomethane. When a suspension of thioglycolic acid Willstätter lignin in dry ether is treated with diazomethane, the methoxyl content increases from 12.6 to 18.5%. For the entrance of three new methoxyl groups, a methoxyl content of 18.3% is calculated. Because hydrochloric acid lignin possesses one phenolic hydroxyl group which is methylated by diazomethane in cyclohexanol suspension, it is doubtful whether all three new methoxyl groups are attached to carboxyl groups. The diazomethane-methylated thioglycolic acid Willstätter lignin still gives the color reaction with phloroglucinol-hydrochloric acid, indicating that the group in the lignin which is responsible for this reaction is still present or is at least easily liberated by the hydrochloric acid of the Wiesner reagent. The fact that thioglycolic acid Willstätter lignin is still insoluble in dilute sodium hydroxide furnishes another proof that it is not sufficient to have phenolic or carboxylic groups present in the lignin molecule in order to render it soluble in caustic soda but that further depolymerization is necessary.

If it is correct that a hydrogen atom of the mercapto group in the thioglycolic acid reacts with a hydroxyl group in the lignin by splitting off water, a fully methylated lignin derivative with no free hydroxyl groups present should not be capable of forming a thioglycolic acid condensation product unless a methoxyl group is split off. Such a loss should be easily

detectable in the methoxyl determination. When a fully methylated glycol lignin (methoxyl content 32%), prepared according to Gray, *et al. (6)*, is heated with a solution of thioglycolic acid in a mixture of methyl alcohol and 4 *N* hydrochloric acid, a lignin-thioglycolic acid condensation product is obtained containing 25.5% methoxyl and 8.5% sulphur. The sulphur content and the decrease in the methoxyl content correspond to the entrance of three thioglycolic acid groups. No methoxyl groups are split off. The presence of acid hydroxyl groups in the new compound is indicated by the fact that the product, unlike the original fully methylated glycol lignin, is now soluble in dilute sodium hydroxide solution from which it is precipitated again by dilute mineral acids but not by carbon dioxide. The entrance of three thioglycolic acid groups into an isolated soluble lignin ether is in agreement with an experiment carried out by Berg and Holmberg *(7)*, who found that ethanol lignin reacts with thioglycolic acid with the formation of a trithioglycolic acid lignin ethyl ether. The fact that thioglycolic acid reacts with fully methylated glycol lignin without loss of methoxyl groups supports an earlier statement *(2)* that, in the reaction of thioglycolic acid with native lignin, no hydroxyl groups are involved. It was indicated in this work, however, that one of the *four* thioglycolic acid groups which enters the *original* lignin may react through its mercapto group with an enolized or hydrated carbonyl group. Since in glycol (and in ethanol) lignin this group is already occupied *(6)*, it is evident that no thioglycolic acid group can react further with this group. This explains the fact that only three thioglycolic acid groups react with fully methylated glycol lignin.

Lignins from deciduous wood, such as beech and maple, have a higher methoxyl content because of the presence of syringyl building stones. Since in the syringyl group both carbon atoms in the ortho position to the hydroxyl group carry methoxyl groups, the formation of furan or pyran rings is not possible and it is the opinion of some lignin chemists *(8, 9)* that the lignin building stones are linked together by ordinary ether linkages. Because the lignin in deciduous woods has six methoxyl groups per lignin building unit as compared with four in lignin from coniferous woods, only two heterocyclic oxygen rings can be present in the lignin building unit. If, in the reaction of thioglycolic acid with lignin, oxygen rings such as furan or pyran rings are opened, with hardwood lignin only two moles of thioglycolic acid can react in this way. It is of interest, therefore, to examine the behavior of native beech and maple lignins towards thioglycolic acid. When these woods are treated with thioglycolic acid and dilute hydrochloric acid and then extracted with dilute sodium hydroxide, thioglycolic acid beech and maple lignins are obtained with 17.2 and 17.8% methoxyl and 9.3 and 9.5% sulphur contents, respectively. From the methoxyl and the sulphur contents, the molecular weight of the lignin building element based either on one methoxyl group or one sulphur atom can be calculated by the following equations:

(a) $(31.02 \times 100)/X = 17.5$ (31.02 being the molecular weight of one methoxyl group and X the molecular weight of the lignin building element containing one methoxyl group)
(b) $(32.06 \times 100)/Y = 9.4$ (32.06 being the atomic weight of one sulphur atom and Y the molecular weight of the lignin building element containing one sulphur atom)

From equation (a) X is calculated to be 177.2; from (b) Y is found to be 341.0. The ratio of methoxyl (17.5/31.02) to sulphur (9.4/32.06) is equal to 5.6 to 2.9 or nearly 2 to 1. In other words, thioglycolic acid lignin from beech or maple has three thioglycolic acid groups per lignin building unit. The molecular weight of this lignin building unit would be $177.2 \times 6 = 1063.2$, or $341.0 \times 3 = 1023.0$ or, as an average value, 1044. On a basis of six methoxyl groups and a molecular weight of 1044, the methoxyl content of beech and maple lignin is calculated to be 23.8%. Isolated native spruce lignin, methylated with diazomethane, contains 21.5% methoxyl, which corresponds to six methoxyl groups per lignin building unit. The methoxyl values for hardwood lignin given in the literature vary from 14.4% *(10)* to 21.5% *(11)*. The methoxyl value of 23.8% calculated on the thioglycolic acid-free basis is probably somewhat too high. This may be due either to a fractionation which takes place during the extraction, (i.e., the lignin in hardwoods consists of a mixture of high and low methoxyl-containing lignins, the average methoxyl content of which is around 21.5% and upon treatment with thioglycolic acid high methoxyl-containing fractions are extracted), or the solid thioglycolic acid lignin in the wood, on extraction with alcohol before extraction of the lignin with sodium hydroxide, reacts with the alcohol, causing an apparently higher methoxyl content. On the other hand, Holmberg *(1)* calculated the methoxyl content for the thioglycolic acid-free lignin from white beech to be 24.2%, from red beech 21.4%, and from maple 23.6%.

It is interesting to note that the thioglycolic acid lignins after isolation are very soluble in dioxane, whereas they are not extracted by dioxane from the thioglycolic acid-treated wood. From this it is concluded that, on extraction with alkali, either a hydrolysis or a depolymerization of what may be called "solid" thioglycolic acid lignin takes place.

In order to check the methoxyl content, beech and maple hydrochloric acid lignins were prepared according to Kalb and Lieser *(12)*. The lignin from beech, obtained in 20.3% yield, has a methoxyl content of 19.9%. The extractive-free wood has a methoxyl content of 5.66%. If all the methoxyl in the wood were combined to the lignin, its methoxyl content would be 27.9%. For maplewood the methoxyl content of the lignin, calculated in this manner, is 29.8%, whereas only 21.25% is found. It is obvious that, when methoxyl-containing carbohydrates are present in the filtrate from the lignin determination and separate as precipitates on warming, the composition of the lignins may be affected by the experimental conditions used in their preparation. It was reported earlier *(13)* and recently confirmed by Freudenberg *(14)* that the standard lignin determination methods are not suitable for deciduous woods.

That a considerable amount of methoxyl-containing material is dissolved in the filtrate from the lignin is shown by the fact that, when the filtrates are diluted to 8 to 10% hydrochloric acid content and heated on a water bath, they soon become cloudy and dark brown precipitates are formed, that from beech lignin having a methoxyl content of 9.45% and that from maple, 16.65%. From spruce, only a very small quantity of precipitate (with a methoxyl content of 0.45%) is obtained. These precipitates are completely soluble in 5% sodium hydroxide and are quantitatively precipitated with mineral acids but not by carbon dioxide. They have, therefore, the character of true humic acids but differ from those prepared from fructose and other ordinary carbohydrates in their methoxyl contents. These humic acid-like products can originate only from partially methoxylated carbohydrates or

uronic acids which might be removed, at least in part, by a mild hydrolysis. Such a removal should be accompanied by a change in the methoxyl content of the wood and of the ratio of methoxyl to lignin in the hydrolyzed wood. When extractive-free beech- and maplewoods are hydrolyzed according to Freudenberg *(14)* by boiling with 7% oxalic acid for 4 hours, 29.2% of the beechwood and 27.1% of the maplewood go into solution. The methoxyl contents of the hydrolyzed woods are found to be 6.5% and5.58%, respectively, as compared with 5.66% and 5.36% before hydrolysis. If no methoxyl-containing material is removed by the hydrolysis, the methoxyl content of the beechwood should be 8.0% and that of the maple7.35%. The difference of 1.5% and 1.8%, respectively, shows that with beechwood about 18.8% and with maplewood as much as 24.5% of the total methoxyl content is removed. The increase in the lignin content in the hydrolyzed beechwood nearly corresponds with the amount of carbohydrates removed, whereas in the case of maple, about 7% of lignin-forming material is removed as water-soluble products. With spruce, hydrolysis with 7% oxalic acid causes an increase in the lignin and methoxyl contents in the same ratio as the decrease in the weight of the hydrolyzed wood and almost all the methoxyl groups are again found in the lignin *(15)*. But even in the hydrolyzed woods, not all the methoxyl left is combined with the lignin. If such were the case, then the methoxyl content of the beech lignin would be 23.7% and that of maple lignin, 25.7%, whereas actually 20.7% and 22.5%, respectively, are found. This difference of about 3% indicates that, in the hydrolyzed woods, there are still methoxyl-containing components which are removed with the filtrates from the lignin determinations.

Methylation of the thioglycolic acid lignins from beech and maple with diazomethane results in the introduction of four new methoxyl groups, of which three may be combined with the three thioglycolic acid groups, and the fourth may have reacted with a slightly acid hydroxyl group in the lignin. This view is supported by the fact that diazomethane-methylated beech and maple thioglycolic acid lignins give only a faint coloration with phloroglucinol-hydrochloric acid, whereas the unmethylated products give a strong color. In this respect these lignin derivatives resemble that from spruce but, unlike the latter, beech and maple lignins react with only three thioglycolic acid molecules instead of four as in the case of spruce. These results are in agreement with those found by Holmberg *(1)*.

It was found by Holmberg and Runius *(16)* that benzyl mercaptan is capable of converting lignin in sprucewood into condensation products soluble in organic solvents. In order to study the reaction taking place between mercaptans and lignin, two experiments were carried out using butyl mercaptan and benzyl mercaptan. The benzyl mercaptan spruce lignin obtained in 39% yield has a methoxyl content of 9.2% and a sulphur content of 9.8%, indicating a methoxyl to sulphur ratio of 1:1. On the basis of a molecular weight of 840 for the lignin building unit containing four methoxyl groups *(3)*, the increase *(X)* in molecular weight caused by the entrance of benzyl mercaptan can be calculated from the equation:

$$(4 \times 31.02 \times 100)/(840 + X) = 9.2$$

and is found to be 509. When this is divided by the molecular weight of 124 for benzyl mercaptan, it is found that 4.1 benzyl mercaptan groups have entered the lignin building unit. If we assume with Holmberg *(16)* that one molecule of water is split off in the reaction, the molecular weight of the benzyl mercaptan lignin building unit is $840 + (4 \times 124) - 18 = 1318$. When the theoretical values for the methoxyl and sulphur contents are calculated, they are found to be 9.4% and 9.7%, respectively, whereas 9.2% and 9.8% are found. This result agrees with that obtained in the condensation of thioglycolic acid with spruce lignin, in which four thioglycolic acid groups are found to combine with the lignin.

The greater reactivity of the thio compounds as compared with the corresponding oxygen derivatives is shown by the difference in the reaction of benzyl mercaptan and of benzyl alcohol *(17)* with lignin. Whereas four benzyl mercaptan molecules react with spruce lignin, only two benzyl alcohol molecules enter the lignin building unit with formation of a benzyl alcohol spruce lignin having a methoxyl content of 11.6% in which two benzyl alcohol groups are very probably combined in an acetal-like manner. When methylated with diazomethane, the methoxyl content of the benzyl mercaptan lignin increases to 12.85% and the sulphur content decreases to 9.4%.

With butyl mercaptan, four of these groups react with the lignin building unit as can be seen from the sulphur content (10.5%), whereas 10.8% is calculated. The methoxyl content (12.1%) is 1.6% higher than the calculated (10.6%), probably because the butyl mercaptan group interferes in the methoxyl determination by the formation of butyl iodide, as has been observed in the analysis of butanol lignin *(18)*.

When hydrochloric acid spruce lignin is heated with a 10% solution of sodium sulphide for 1 hour at 170° it is completely dissolved, giving a thio lignin with a methoxyl content of 14.4% and a sulphur content of 3.8% or a ratio of methoxyl to sulphur of 4.65:1.2 or 4:1, indicating that one hydrogen sulphide molecule has entered the lignin building unit. Calculated on this basis, the theoretical methoxyl content is found to be 14.2% and the sulphur content 3.7%. For thio lignin directly extracted from sprucewood and purified through the mercury compound, Ahlm *(19)* found 14.4 and 3.7%, respectively.

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Correction

In the paper by L. L. Klinger, "Improvements in the Coagulation of Surface Waters with Activated Silica," which was published in the April 11, 1946 issue of the PAPER TRADE JOURNAL, the analysis of the water from the Wisconsin River lists "Soluble solids" instead of "Volatile Solids."

Kraft Digester Circulating and Indirect Heating Systems*

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Abstract

Difficulties experienced with kraft digester circulating and indirect heating systems can be classified as relating to design, maintenance, and benefits derived therefrom. Troubles are experienced with the strainers within the digester owing to location, sufficient area, corrosion, and lime scale formation. Corrosion and abrasion are also effective on outlet nozzles, pipe, valves, and heater parts. Circulating pumps should be selected with suitable capacity, operating characteristics, and materials of construction. The heater should be of suitable size for the cooking cycle employed, should have suitable liquor velocity through the tubes, and be constructed for low maintenance operation. The advantages of a circulating system are dependent upon digester size, pulp grade, and cooking cycle. An indirect heating system requires an external circulating system and will usually result in benefits to production, quality, yield, or chemical usage. The disadvantages are maintenance cost and power requirements.

Future trends are toward employment of indirect cooking in conjunction with external circulation for reasons of economy, and toward use of alloy steels.

Digester circulating systems can be divided into two main classes. The first of these is one which was used mainly in past years, and which consisted of some means of agitating the contents of the digester without external equipment. This could be done by the introduction of steam into internal pipes and is today accomplished most effectively by tumbling or rotating digesters. The second principal method which is in wide use today for circulating and distributing the cooking reaction within a digester is accomplished by means of a pump and external piping. Common practice is to withdraw the liquor from some point in the digester through suitable strainers and return it to a point remote from the strainers, causing a flow of liquor through the digester contents which distributes the heat.

An indirect heating system is different from a direct heating system in that the condensed steam does not dilute the contents of the digester. This is easily accomplished by use of an external circulating system and a tubular heater which supplies all or most of the heat requirements of the cook. The principal benefit from an indirect heating system in a kraft mill employing a recovery system is the savings in evaporation of the black liquor owing to the elimination of the condensed steam from the digester contents.

This paper will attempt to describe the principal troubles and preventive remedies encountered in kraft mills' circulating and indirect heating systems in the United States and Canada rather than attempt a comparison of systems as built by different manufacturers.

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Difficulties can be divided into three main classifications, the first of these being fundamental design. The design must be such that the system functions as intended—namely, to move mechanically the heat and material to the best advantage. Obviously, it must be designed with sufficient capacity in the various component parts to accomplish the result in the given time. The second classification involves maintenance of equipment. Materials of construction and working parts must be such that sufficient uninterrupted operation is obtained to secure the desired benefits. If the maintenance of equipment is an important factor in any particular system, this cost must be balanced against the advantages which have been accomplished. The third classification is in the evaluation of the benefits which might be derived from a system for any given set of cooking conditions. It is conceivable that certain types of mills would not sufficiently benefit to overcome the cost of power and maintenance required. On the other hand, in most localities—and particularly for mills desiring a higher grade of pulp—the benefits are such as to make both circulation and indirect heating highly desirable.

Units in System

A circulating and indirect heating system is, in reality, a simple hydraulic and thermodynamic balance, which is complicated to a great extent by unknown conditions which exist in various pulp mills. The starting point in a design is the selection of strainer location and the point at which the circulated liquor is returned to the digester. This is a controversial subject, and no great amount of exact experimental data is available to prove or disprove various methods employed. Strainers in the past, and even at present, are located at various points in the digester from the bottom to the top, including intermediate points. Location of strainers bears a definite relation to the amount of liquor that can be circulated and the total volume of liquor used in the digester. These factors should be taken into consideration in the preliminary design, so that proper hydraulic function will result.

In addition to the strainer location, there are other factors that should be taken into account in this connection. The strainers should have sufficient area for liquor removal. The size of the holes in the strainer and the strainer area are important factors in being able to maintain a sufficient rate of circulation throughout the cook. Many systems in the past have been improperly designed with a resulting decrease in circulation toward the latter part of the cook which seriously affects the results obtained. In some mills the strainers both corrode and erode rapidly causing high maintenance and poor operation. There are also many mills experiencing trouble from rapid lime scale formation on the strainer area. These last two difficulties can both be eliminated or retarded for practical operation by the use of alloy steels, such as 18-8 stainless.

The outlet nozzles through the digester shell are

subject to severe abrasion and sometimes corrosion, since the velocity at this point is usually high. This has been corrected in many instances by the installation of a light gage stainless steel lining, which is relatively inexpensive and easy to install.

Pipe and valves in the external piping are both subject to lime scale formation and corrosion. These are usually not too severe, and the high relative cost of alloy steels does not make their use practical. Scale formation can sometimes be retarded by maintaining comparatively high velocities in the piping.

Pumps

The circulating system pump plays an extremely important part in the system as a whole. Regardless of design, all circulating systems evidence a tendency for the circulating rate to drop toward the latter part of the cook because of the softening of the chips in the digester. This phenomenon increases the friction head on the pump suction and promotes a poor pumping condition. Because of this, the circulating pump should be slow speed and have a large impeller eye diameter. Pumps of this type usually have better operating characteristics for this service. It is also important that the pump have a suitable characteristic curve since pressure conditions within the system are constantly changing and the pump must be able to adjust itself to these conditions without too great a decrease in capacity. The efficiency of the pump is important where power costs are high. The liquor in some mills is more corrosive to mild steel than in others, and in many cases it is most economical to use alloy steel construction in the pump to decrease maintenance costs. The pump packing is often a source of serious trouble because of the high temperatures and pressures encountered. Deep stuffing boxes are usually required, with water lubrication; and there is always the danger of worn packing allowing excessive water to mix with the liquor and thereby cause unnecessary dilution. The pump capacity should be sufficient to circulate the liquor through the digester a sufficient number of times during the cooking cycle to provide good heat distribution. It must also pump a sufficient volume of liquor through the heater to maintain a reasonably low temperature rise through the heater. If the liquor temperature rises too rapidly in passing through the heater, the liquor might flash upon leaving the tubes which would wear them out rapidly.

Heaters

The selection of a heater for an indirect cooking system involves several factors which are all important. In the first place, the heater must have sufficient heating area which, at a given steam pressure, will transfer sufficient heat to bring the digester up to temperature in the required time. The heater should be constructed of materials which will not wear out rapidly under conditions prevailing in the mill. Mild steel tubes have shown an excellent life in some localities, but it has been found very advantageous to use alloy steel tubes in others.

The majority of the tubular heaters in use today are either single-pass or two-pass. There are definite reasons for the preference for either one of these. The single-pass heater has the advantage that the friction loss and, hence, the power requirements are less. Frequently, a single-pass heater will more easily fit into the piping arrangement. A single-pass heater has the disadvantage that the tubes are usually comparatively long and, hence, difficult to clean if scale formation occurs. Where alloy steel tubes are used, the length of the tubes makes it difficult to compensate for expansion strains caused by temperature differences between the tubes and other parts of the heater. The two-pass heater has the advantages of shorter tubes and a simpler means of compensating for expansion strains. In the selection of either type heater it is extremely important to maintain suitable liquor velocities through the heater tubes since lime scaling tendencies are present in all mills.

Returning the circulated liquor to the digester is sometimes a problem. If the liquor is put into the top of the digester, it is sometimes felt necessary to employ some means of distribution over the top area of the digester. Spray rings and distribution cones for this purpose have been a source of trouble, due to corrosion and the difficulty of holding them in place. They have the added disadvantages of sometimes interfering with chip filling. In some cases the liquor is put into the bottom of the digester through a tee. Here, the high velocity and resulting turbulence often cause severe erosion or corrosion.

Operating Difficulties

In general, assuming the fundamental design is correct from the mechanical and thermodynamic standpoint, operating difficulties can be divided into the following classifications:

First—Corrosion, which can be corrected by the use of suitable materials of construction.

Second—Lime scale formation, which is aggravated by the following conditions: 1. poor white liquor clarification, 2. low liquor velocity, 3. extremely high liquor temperature rise in passing through heater, 4. extreme high temperature difference between steam and liquor passing through heater, 5. superheat in steam, and 6. mill supply water being extremely hard.

The third trouble is lack of sufficient benefit to the particular operation. With indirect heating there is always a savings in evaporation which, in itself, will usually justify the equipment. The application of circulation itself without indirect heating is dependent upon the size of the digester, the grade of pulp desired, and the cooking cycle used. If the system is carefully designed, it will allow considerable latitude in grade of pulp produced and cooking cycle used, so that the mill is not limited in operation. A careful analysis of these in comparison with successful systems in operation today will give some indication of what results might be expected. These are classified as increased production, increased quality, increased yield, or decreased chemical usage. These benefits have to be balanced against the disadvantages of the equipment such as amount of maintenance which might be expected and the power requirements.

From a study of the industry throughout the country today, it seems that future trends are toward more wide use of both circulation and indirect cooking. Circulation is more important in the mills seeking higher quality grades, and indirect cooking is important to all mills as a step toward more economical operation. Satisfactory indirect cooking has not been accomplished without external circulation, which makes these two go hand in hand. Trends are also toward the use of more alloy steel construction for more permanent and maintenance-free installations. The operators welcome the use of alloy steels, where beneficial, and realize that their slightly higher cost pays large dividends in future operations.

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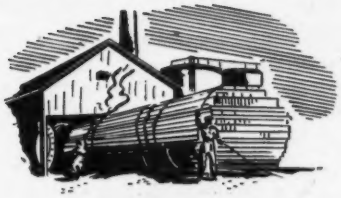

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Week's Record of Trends in The Paper and Pulp Market

Office of the PAPER TRADE JOURNAL,
Wednesday, May 22, 1946.

Supply-demand situation for paper and paperboard shows little over-all change. Mills are booked well in advance with no diminution in the demand and are still obliged to allocate production among their customers. Uncertainties lying in the future make mills hesitate to commit themselves very far in advance. Shortage of wood has forced several mills to cut operations to five days a week. Other mills, which are running seven days, are not utilizing all machines. With the freight embargo called off the industry gained a slight breathing spell. There remain, however, to plague transportation, the prospect of a general railroad strike, a possible strike by air pilots any time between now and June 7, and the maritime strike set for June 15.

The gap between demand and supplies of printing papers appears to be growing in spite of encouraging increases in production. Although the supply of fine papers seems more adequate, there is no change in market tenseness. The principal feature of the demand for printing paper centers in the field of magazine publication. With an increase in advertising, the production of consumer durable and nondurable goods still fails to satisfy the excessive consumer demands. While attempting to satisfy current needs, producers are looking to the future. They are currently using magazine advertising to help establish and maintain their positions in that future. Book publication, apparently geared to mass distribution policies, is reaching out for more and more paper. Converting industries which use printing and fine papers are equally hard pressed.

The index of general business activity for the week ended May 11 fell to 124.3 from 126.8 in the previous week, compared with 141.4 for the corresponding week in 1945. The index of paperboard production fell to 173.9 from 177.2 in the previous week, compared with 160.4 for the corresponding week in 1945.

Paper production for the week ended May 11 was estimated at 102.8 per cent, compared with 107.3 for the preceding week, with 85.4 for the corresponding week in 1945, with 87.6 for 1944, with 91.1 for 1943, and with 97.8 per cent for the corresponding week in 1942.

Paperboard production for the week ended May 11 was 97.0 per cent of capacity, compared with 101.0 per cent for the preceding week, with 94.0 for the corresponding week in 1945, with 95.0 for 1944, with 96.0 for 1943, and with 82.0 per cent for the corresponding week in 1942.

Wood Pulp

Imports of wood pulp during March and April were very light and many converting mills had to make withdrawals from their inventories. Domestic production continues to improve, however, and shipments from Scandinavian countries are expected soon. Some pulp is reportedly being loaded at Finnish ports, and presumably at some Swedish ports as well. Shipments from Norway are not expected until later in the season.

Rags

Roofing felt mills are currently interested in foreign rags at about $70, or domestic heavy wipers at $50 to $55; No. 1s and 2s regular stock at $31 and $29 shipping point plus brokerage.

Egyptian colored rags were reportedly offered at $76 and $80 dock recently. Egyptian whites were offered around 4.50c dock.

Old Rope and Bagging

Market for old rope remains unchanged. Prices are steady and firm at ceiling levels. The import position does not loom as a factor at this date.

Confusion over the coal strike and railroad embargo cut demand for bagging this week. Dealers had difficulties finding buyers for such scarce items as mill gunny at $4.50 delivered. Foreign gunny was offered at $4.25 per 100 pounds ex-dock. Southern mill bagging remains at $3.50 to $3.75; some dealers ask $4 shipping point. No. 1 scrap burlap was relatively quiet and in light demand at $3.00 to $3.25. Egyptian light hessians are reported at $3.25 to $3.75 dock eastern seaboard.

Waste Paper

First quarter collections during 1946 were 1,773,862 tons, consisting of 593,068 tons in the month of January, 545,602 tons in February and 635,192 tons in March, compared with a total of 1,692,000 tons in the corresponding three months of 1945. Demand for waste paper remains relatively quiet. Mill buyers were cautious in their purchases, some mills holding up all shipments. Prices continue unchanged at ceiling levels.

Waste paper dealers are very much concerned over the rumor out of Washington that the OPA will rescind the provision in MPR No. 30 of a $5 per ton premium that has prevailed on waste paper packed in bales of 500 pounds or more for the past two years. Such action, it is feared, might easily force dealers out of business.

OPA Alters Formula On Imported Resins

WASHINGTON, D. C. — Existing dollar-and-cent ceilings for imported natural resins have been replaced by formula ceilings that will be generally higher than the previous prices by the Office of Price Administration. The new ceilings, which became effective May 21, 1946, will be determined by each importer by use of the automatic pricing formula in the Maximum Import Price Regulation. This formula allows landed costs, plus customary industry mark-up.

Imports of natural resins, which come mainly from the Far East, were halted by the war, and the dollar-and-cent ceilings that have been in effect applied mainly to stocks in this country. These stocks are now about used up, and importers, seeking a resumption of purchases abroad now that the war is over, report that exporters are asking prices substantially above their ceilings for resales in the United States.

By allowing ceilings under the import regulation, composed of landed costs and mark-up, today's action will facilitate buying by those importers who still want to bring in the resins.

OPA said the higher costs could be allowed as a basis for the new ceilings without hurting the stabilization program.

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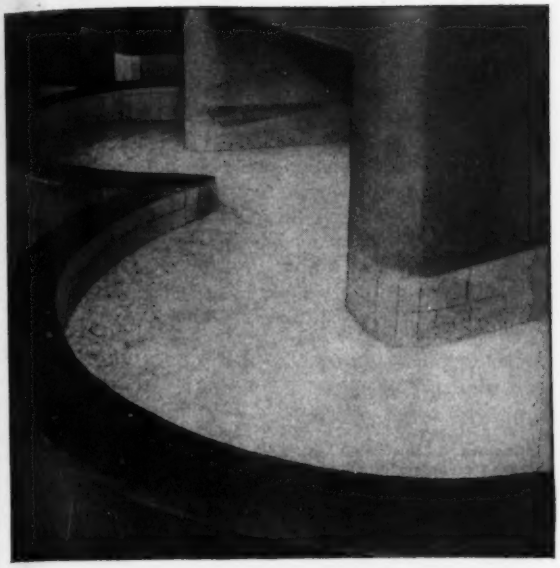

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, May 22, 1946.

BLANC FIXE—Market continues steady. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Demand remains very active. Supply situation is reported favorable at this date. Quotations are unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 33 cents per pound; 2,000 pounds, 33¼ cents per pound; less than 2,000 pounds, 33¾ cents per pound, f.o.b. shipping point. Imported, 33 cents per pound.

CAUSTIC SODA—Demand is reported very heavy. Production large, but deliveries slow. Market tight. Supply of drums short. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 to $2.95 per 100 pounds.

CHINA CLAY—Relatively moderate demand reported. Quotations remain unchanged. Supply short. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Heavy demand with essential paper requirements fully met. Quotations unchanged. Chlorine is currently quoted at $2.00 to $2.25 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—No offerings and sales. "G" gum rosin is quoted at $6.74 per 100 pounds, in barrels, at Savannah; "FF" rosin at $6.70 per 100 pounds in barrels, at New York; seventy percent gum rosin size at $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Quotations on salt cake are reported unchanged for the current week. Current demand is reported firmer. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand continues for over-all requirements. Market remains tight with demand above output. Bulk lot shipments steady. Bagged lots still slow. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.95; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market restricted due to small supply. Prices steady. Starch prices continue unchanged. The pearl grade is quoted at $3.72 per 100 pounds; powdered starch at $3.83 per 100 pounds; all prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand reported active. Supply situation improving. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.35 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.75 to $2.00 per 100 pounds, in bags, at works.

SULPHUR—Quotations on sulphur continue to conform to prevailing market prices. Demand active. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price at Gulf Ports is $17.50 per long ton.

TALC—Prices on talc continue unchanged. Demand good. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $24 to $30 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$67.00	@	—
Sheets	75.00	@	—

* OPA Maximum Price.

Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—

* OPA Manufacturers' Prices.

Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—

Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—

Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—

Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila 35 lb.	6.00	"	7.00

Boards, per ton—			
News	*$54.00	@	—
Chip	*54.00	@	—
Sgl. Mla. Ll. Chip	*65.00	@	—
White Pat. Coated	*79.00	@	—
Kraft Liners 50 lb.	*74.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper
Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@$15.50
No. 2 Glossy Coated	12.40 " 14.00
No. 3 Glossy Coated	11.60 " 13.25
No. 4 Glossy Coated	11.15 " 12.75
No. 1 Antique (watermarked)	10.25 " 11.75
No. 2 Offset	9.60 " 11.00
A Grade E. F.	9.35 " 10.75
A Grade S. & S. C.	9.60 " 11.00
B Grade E. F.	8.85 " 10.25
B Grade S. C.	9.10 " 10.50
C Grade E. F.	8.55 " 9.75
C Grade S. C.	8.80 " 10.00
D Grade E. F.	8.25 " 9.50
D Grade S. & S. C.	8.50 " 9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers' Prices, Less Freight. Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$94.00
Unbl. Softwood Sulphite	82.00
Bl. Hardwood Sulphite	91.50
Unbl. Hardwood Sulphite	79.50
Bl. Glassine Sulphite	97.00
Unbl. Glassine Sulphite	86.00
N. Bleached Sulphate	94.00
S. Bleached Sulphate	88.00
N. Semi-Bleached Sulphate	89.00
S. Semi-Bleached Sulphate	83.00
N. Unbl. Sulphate	76.00
S. Unbl. Sulphate	69.50
Bl. Soda	84.00
Unbl. Soda	80.00
Groundwood	58.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$12.50
Lake Central	12.50
Southern	15.00
West Coast (in area)	9.50
West Coast (out area)	15.50

	50%-80% Air Dry Weight
Northeast	$10.50
Lake Central	10.50
Southern	13.00
West Coast (in area)	8.50
West Coast (out area)	14.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$7.50
Lake Central	7.50
Southern	10.00
West Coast (in area)	6.50
West Coast (out area)	12.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags
(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

"S"

SILICATE BEATER SIZE

TUCKS IN SHORT FIBRES

For troublesome, short fibre pulps, use S Silicate in your beater. S Brand, a PQ Silicate of low alkali content, chemically reacts with alum to form a light, flocculent size. This catches the short fibres as well as the clay, rosin and other fillers. The result is a harder sheet with a smooth finish.

Another advantage is the increase in output, which may amount to 30 pounds per ton.

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KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

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Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

EVERY once in a while, a reader of our advertisements asks "Just how can you help *me*?" Perhaps you've wondered also what we can do to assist *you*. The easiest way to answer the question is to recount what was done in a very recent case.

DECEMBER 15 . . . Inquiry received from manufacturer, stating his desires and general requirements.

DECEMBER 22 . . . Brief mailed to manufacturer, containing detailed information on four sites recommended for his consideration.

DECEMBER 28 . . . Manufacturer wrote asking Seaboard representative to call.

JANUARY 10 . . . Seaboard representative called on manufacturer and supplied additional information. Dates set for inspection of sites.

FEBRUARY 18 through 21 . . . Seaboard representative met the manufacturer and conducted party to various sites under consideration. Conferences were held, as desired by the manufacturer, with interested officials and citizens of each community visited.

MARCH 15 . . . In the interim the manufacturer made tentative decision as to preferred site. Revisited the community involved and made decision to locate new plant at that point.

Seaboard representative continued to assist manufacturer in matter of securing services of construction engineer and contractor and other matters pertaining to closing of transaction.

Only our long experience and intimate knowledge of local conditions in the Southeast made possible such expeditious and satisfactory handling for this manufacturer. Whatever your plant location problems, that same experience and knowledge are available to you for their solution. Our services are rendered in strict confidence and without obligation on your part. Simply address:

Dallas T. Daily
General Industrial Agent
Seaboard Air Line Railway
Norfolk 10, Va.

THROUGH THE HEART OF THE SOUTH

Old Rags

White, No. 1—			
Repacked	*3.84	@	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	1.50	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¾
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean Bright—			
Sisal Strings	.84	"	—
No. 2 Clean Bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	1.60	"	—
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South America	—	"	3.25

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	1.60	"	—
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South America	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¼
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¼
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

Mill Cogs

ON SHORTEST POSSIBLE NOTICE

We make all kinds of Mill Cogs and have special facilities that will be of great service to you. We make a specialty of "ready dressed" cogs which are

READY TO RUN

the moment driven and keyed. Write at once for circular "G" and instruction sheets free.

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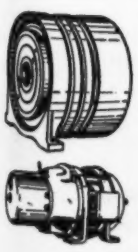
Worn Rollers Re-Engraved.

Complete Designing and Engineering Service



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BY A PIONEER MANUFACTURER

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The use of Stearns magnetic products may be your opportunity to lower production cost. An inquiry may prove a definitely profitable investment. Write for our interesting bulletins 225, clutches; 504, brakes.

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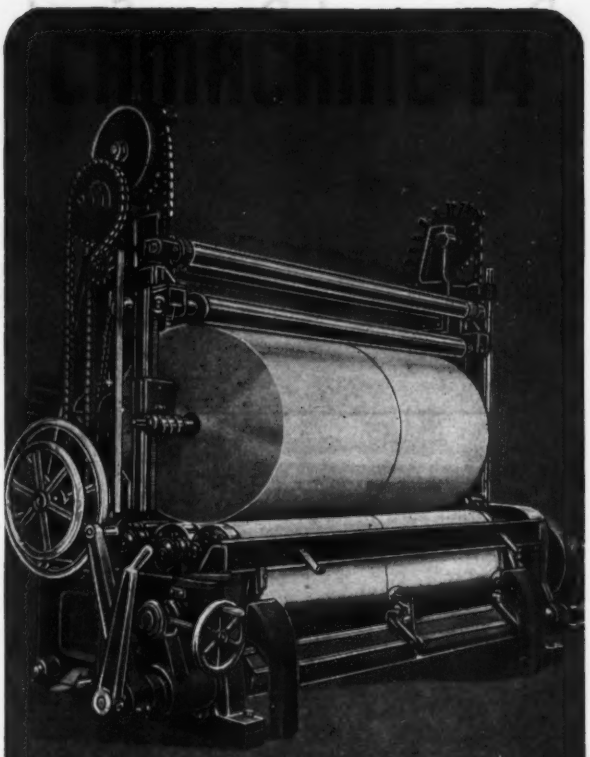
609 S. 28th St. Milwaukee, Wis.



CAMACHINE 14 operates as the winding unit of paper machines not exceeding 500 F.P.M. paper-making speed and 92" trim width. When used in this capacity, the winder can be operated at speeds up to 1,400 F.P.M. The machine is also used extensively as a rewinder in finishing rooms and paper converting plants.

In board mills this winder is used in connection with the board machines and as a rewinder in the finishing rooms. In such work CAMACHINE 14 operates at speeds up to 800 F.P.M. In whatever application it may be used, this unit has all of the notable features found in CAMACHINES of greater widths and speeds.

GET FACTS!

WRITE FOR THIS FOLDER

CAMERON MACHINE COMPANY
61 Poplar Street, Brooklyn 2, N. Y.
MIDWEST OFFICE: 111 W. MONROE ST., CHICAGO, ILL.

Paper and Paper Stock Imports At New York and Other Ports

NEW YORK IMPORTS

WEEK ENDING MAY 18, 1946

SUMMARY

Newsprint .....13,882 rolls
Printing Paper .....2 cs.
Paper Hangings .....33 bls.
Filter Paper .....24 cs.
Drawing Paper .....2 cs.
Photo Paper .....208 cs.

NEWSPRINT

H. G. Craig Co., Newscarrier, Donnacona, Quebec, 396 rolls.
H. G. Craig Co., G.T.D., Donnacona, Quebec, 347 rolls.
N. Y. World Telegram, Cornerbrook, Cornerbrook, N.F., 1023 rolls.
N. Y. Sun, Cornerbrook, Cornerbrook, N. F., 835 rolls.
Clinton Paper Corp., Cornerbrook, Cornerbrook, N. F., 954 rolls.
Great Atlantic Paper Co., Cornerbrook, Cornerbrook, N. F., 832 rolls.
Tenafly Printing Corp., Cornerbrook, Cornerbrook, N. F., 120 rolls.
Evening Bulletin, (Philadelphia), Cornerbrook, Cornerbrook, N. F., 2090 rolls.
News Syndicate Co., Inc., Colabee, Baie Comeau, Quebec, 7285 rolls.

PRINTING PAPER

Stevens Nelson Paper Corp., St. Lawrence Victory, London, 1 cs.
S. H. Pomerance Co., Inc., St. Lawrence Victory, London, 1 cs.

PAPER HANGINGS

Stevens Nelson Paper Corp., St. Lawrence Victory, London, 33 bls.

FILTER PAPER

H. Reeve Angel & Co., Inc., St. Lawrence Victory, London, 24 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., St. Lawrence Victory, London, 2 cs.

PHOTO PAPER

Intercontinental Forwarding Co., St. Lawrence Victory, London, 208 cs. (raw base paper).

RAGS, BAGGINGS, ETC.

(———), Thomas R. Marshall, Antwerp, 90 bls. rags.
Mifflin & Diottavio, Inc., Buenos Aires, Buenos Aires, 85 bls. cotton picker waste.
J. Eisenberg Co., Buenos Aires, Buenos Aires, 26 bls. rags, 3 bls. worsted waste.
M. Sigal & Sons, Buenos Aires, Buenos Aires, 244 bls. rags.
New England Waste Co., African Prince, Santos, 221 bls. cotton waste.
Royal Manufacturing Co., African Prince, Santos, 116 bls. cotton waste.
Swiss Banking Corp., African Prince, Montevideo, 10 bls. threadwaste.
W. J. Green Co., Inc., Jan van Goyen, Antwerp, 134 bls. rags.
A. W. Fenton Co., Jan van Goyen, Antwerp, 413 bls. old dark cotton rags.
Castle & Overton, Inc., Jan van Goyen, Antwerp, 190 bls. dark cotton rags; 159 bls. mixed fustians; 345 bls. rags.
Tradesmans National Bank Trust Co., St. Lawrence Victory, London, 332 bls. rags.
J. Eisenberg Co., Kenyon Victory, Liverpool, 17 bls. wool rags.
(———), Kenyon Victory, Liverpool, 87 bls. rags.
(———), Lord O'Neill, Glasgow, 90 bls. rags.
Manhattan Batting & Felting Co., Alf. Lindeberg, Santos, 179 bls. cotton waste.
American Cotton Products Co., Alf. Lindeberg, Santos, 292 bls. cotton waste.
Train Smith Co., Nonpareil, Glasgow, 120 bls. paperstock.
Tradesmans National Bank Trust Co., Nonpareil, Glasgow, 115 bls. bagging.
(———), Nonpareil, Glasgow, 73 bls. paperstock.
State Street Trust Co., Nonpareil, Glasgow, 243 bls. paperstock.

GLUESTOCK

H. Remis & Co., Illapel, Havana, 437 bls. gluestock.
Darmstadt Scott & Courtney, Buenos Aires, Buenos Aires, 101 bls. gluestock.
H. Remis & Co., African Prince, Santos, 48 bls., 144 rolls gluestock.
Trans-atlantic Animal By-Products Corp., African Prince, Buenos Aires, 47 bls., 22 casks gluestock.

BONEGLUE

Trans-atlantic Animal By-Products Corp., Waterville Victory, Santos, 400 bags.

WOODPULP

Parsons & Wittemore, Inc., Drottningholm, Gothenburg, 1116 bls. dry bleached sulphite.
Perkins Goodwin Co., Drottningholm, Gothenburg, 1 parcel woodpulp.

NORFOLK IMPORTS

WEEK ENDING MAY 18, 1946

Fayetteville Observer Cornerbrook, Cornerbrook, N. F., 339 rolls newsprint.
Bowater Paper Co., Cornerbrook, Cornerbrook, N. F., 788 rolls newsprint.
Raleigh Times, Cornerbrook, Cornerbrook, N. F., 432 rolls newsprint.
The Salisbury Post, Cornerbrook, Cornerbrook, N. F., 265 rolls newsprint.
Winston Salem Journal & Sentinel, Cornerbrook, Cornerbrook, N. F., 859 rolls newsprint.
Granville News Piedmont, Cornerbrook, Cornerbrook, N. F., 98 rolls newsprint.
Herald-Sun Papers, Cornerbrook, Cornerbrook, N. F., 106 rolls newsprint.
Lexington Despatch, Cornerbrook, Cornerbrook, N. F., 57 rolls newsprint.
Kannapolis Independent, Cornerbrook, Cornerbrook, N. F., 67 rolls newsprint.
Suffolk News-Herald, Cornerbrook, Cornerbrook, N. F., 30 rolls newsprint.
New Bernian Sun Journal, Cornerbrook, Cornerbrook, N. F., 57 rolls newsprint.
Danville Register & Bee, Cornerbrook, Cornerbrook, N. F., 432 rolls newsprint.
Rocky Mount Evening Telegram, Cornerbrook, Cornerbrook, N. F., 79 rolls newsprint.
Raleigh News & Observer, Cornerbrook, Cornerbrook, N. F., 905 rolls newsprint.
Wilmington Star News, Cornerbrook, Cornerbrook, N. F., 509 rolls newsprint.
Old Dominion Paper Co., Cornerbrook, Cornerbrook, N. F., 202 rolls newsprint.
Virginia Paper Co., Cornerbrook, Cornerbrook, N. F., 428 rolls newsprint.
Kingston Free Press, Cornerbrook, Cornerbrook, N. F., 129 rolls newsprint.

Enters Paper Export Field

The Central National Corporation, 22 East 40th Street, New York City, has formed a Commercial Division, which will specialize in the export of all grades of paper and paper products. The Commercial Division is under the management of E. R. Southouse, who has been elected assistant vice-president of the corporation. Mr. Southouse has had a lifetime association with the export paper industry in the United States, Europe, and world markets. The Division, has arranged representation in most important world markets importing paper. D. S. Gottesman, president of Gottesman & Company, Inc., woodpulp agents, is also president of the Central National Corporation.

Springfield Accountants Elect Strathmore's Mrs. Hanchett

SPRINGFIELD, Mass.—Mrs. Robert B. Hanchett, cost accountant for the Strathmore Paper Co., has been elected secretary of the Springfield chapter of the National Association of Cost Accountants.